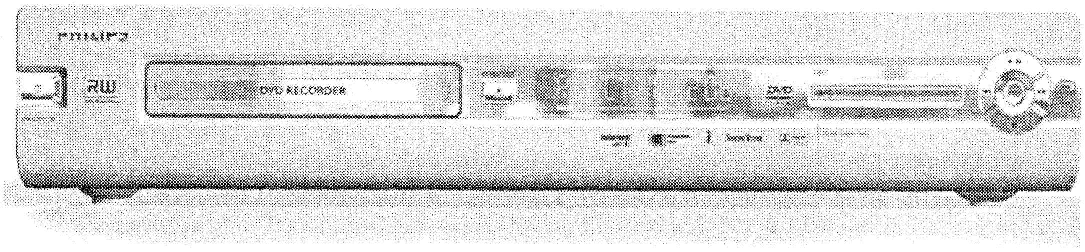
DVD-Video Recorder

DVDR730/0x

Service
Service
Service



Service Manual

CLASS 1
LASER PRODUCT

RW
DVD+ReWritable

DVD
VIDEO

COMPACT
disc
DIGITAL VIDEO

COMPACT
disc
DIGITAL AUDIO

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For repair information on the Basic Engine, refer to Service Manual DVD+RW VAD8041, 12NC: 3122 785 14850.

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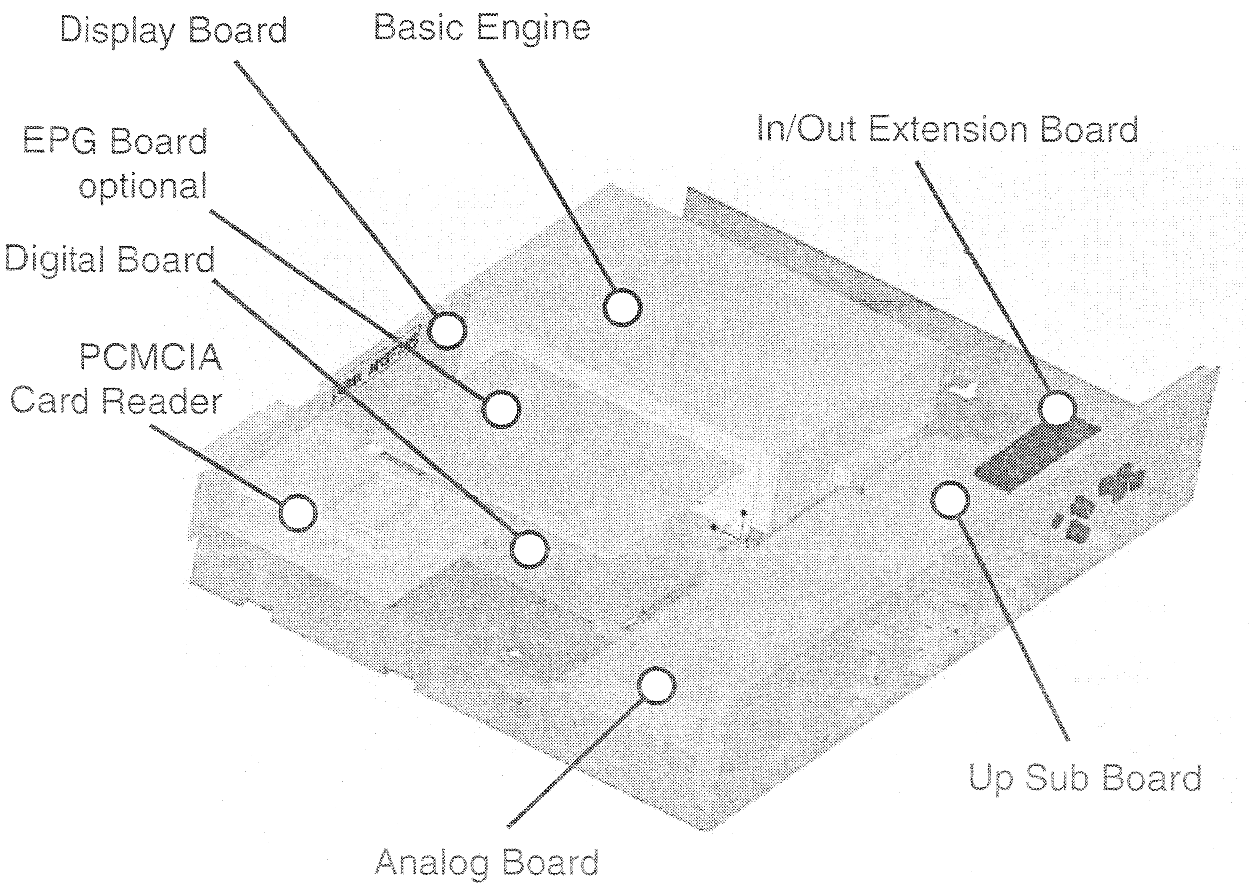
Published by GH 0493 Service PaCE Printed in the Netherlands Subject to modification EN 3122 785 14230

PHILIPS

1. Technical Specifications and Connection Facilities

1.1 PCB Locations



Remarks:
The EPG Board is not present in the DVDR730.

1.2 Diversity Matrix

Type	DVDR730/00/02
Digital Board Chrysalis PAL Progressive	PBAS CHRY PPS_E5_AV3 _PLUS
Basic Engine AV3.5	VAD8041/01
I/O Extension Board	PBAS IOE IST E2
UP Sub Board	PBAS UP SUB IST PLUS E1 NG
Analog-Board	PBAS AB IST PLUS E1 NG
Display Board	PCB ASSY PB DC1 IST

1.3 General:

Mains voltage : 198V-276V
Mains frequency : 43 Hz - 63Hz
Power consumption mains : 28 W
Power consumption standby : < 7 W
Power consumption low power stand-by : < 3 W

1.4 RF Tuner

Test equipment:Fluke 54200 TV Signal generator

Test streams:PAL BG Philips Standard test pattern

1.4.1 System:

PAL B/G, PAL D/K, SECAM L/L', PAL I

1.4.2 RF - Loop Through:

Frequency range : 45 MHz - 860 MHz
Gain: (ANT IN - ANT OUT) : -6 dB to 0dB

1.4.3 Radio Interference:

input voltage /3 tone method (+40 dB min) : no limit

1.4.4 Receiver:

PLL tuning with AFC for optimum reception
Frequency range: : 45.25 MHz - 857 MHz
Sensitivity at 40 dB S/N : ≥ 60dBµV at 75Ω (video unweighted)

1.4.5 Video Performance:

Channel 25 / 503,25 MHz,
Test pattern: PAL BG PHILIPS standard test pattern,
RF Level 74 dBV

Measured on SCART 1
Frequency response: : 0 - 4.00 MHz +0-4dB
Group delay (0.1 MHz - 4.4 MHz) : 0 nsec ± 150nsec

1.4.6 Audio Performance:

Audio Performance Analogue - HiFi:
Frequency response at SCART 1 (L+R) output: : 100 Hz - 12 kHz / 0± 3dB
S/N according to DIN 45405, 7, 1967 : and PHILIPS standard test pattern video signal: : FM: ≥ 50dB; AM ≥ 45dB, unweighted
Harmonic distortion (1 kHz, ± 25 kHz deviation): : FM ≤ 1.5%; AM ≤ 2%

Audio Performance NICAM:
Frequency response at SCART 1(L+R) output: : 40 Hz - 15 kHz 0 ± 3dB
S/N according to DIN 45405, 7, 1967 : and PHILIPS standard test pattern video signal: : ≥ 60 dB unweighted
Harmonic distortion (1 kHz): : ≤ 0.5 %

1.4.7 Tuning

Automatic Search Tuning
scanning time without antenna : typ. 3 min. PAL
stop level (vision carrier) : ≥ 37dBµV
Maximum tuning error of a recalled program : ± 62.5 kHz
Maximum tuning error during operation : ± 100 kHz

Tuning Principle
automatic B,G, I, DK and L/L'detection
manual selection in "STORE" mode

1.5 Analogue Inputs

1.5.1 SCART 1 (Connected to TV)

Pin Signals:

1	- Audio R	1.8V RMS	○→
2	- Audio R		→○
3	- Audio L	1.8V RMS	○→
4	- Audio GND		⏚
5	- Blue/Chroma GND		⏚
6	- Audio L		→○
7	- Blue out/ Chroma in	0.7Vpp ± 0.1V into 75 Ohm (*)	▭→
8	- Function switch	<2V = TV >4.5V / <7V = asp. ratio 16:9 DVD >9.5V / <12V = asp. ratio 4:3 DVD	○→
9	- Green GND		⏚
10	- P50 control		▭→
11	- Green	0.7Vpp ± 0.1V into 75 Ohm (*)	
12	- Nc		
13	- Red/Chroma GND		⏚
14	- fast switch GND		⏚
15	- Red out/ Chroma out	0.7Vpp ± 0.1V into 75 Ohm (*) ± 3dB 0.3Vpp Chroma (burst)	▭→
16	- fast switch RGB/ CVBS	or Y <0.4V into 75 Ohm = CVBS >1V / <3V into 75 Ohm = RGB	○→
17	- Y/CVBS GND OUT		⏚
18	- Y/CVBS GND IN		⏚
19	- CVBS/Y	1Vpp ± 0.1V into 75 Ohm (*)	○→
20	- CVBS/Y		→▭
21	- Shield		⏚

1.5.2 SCART 2 (Connected to AUX)

Pin Signals:

1	- Audio R	1.8V RMS	○→
2	- Audio R		→○
3	- Audio L	1.8V RMS	○→
4	- Audio GND		⏚
5	- Blue/Chroma GND		⏚
6	- Audio L		→○
7	- Blue in/Chroma out	± 3dB 0.3Vpp Chroma (burst)	▭→
8	- Function switch		→○
9	- Green GND		⏚
10	- P50 control		▭→
11	- Green		→▭
12	- Nc		
13	- Red/Chroma GND		⏚
14	- fast switch GND		⏚
15	- Red in/Chroma in		→▭
16	- fast switch RGB/ CVBS or Y		→○
17	- CVBS GND OUT		⏚
18	- CVBS GND IN		⏚
19	- CVBS/Y/RGB sync	1Vpp ± 0.1V into 75 Ohm (*)	○→
20	- CVBS/Y		→▭
21	- Shield		⏚

(*) for 100% white

1.5.3 Audio/Video Front Input Connectors

Audio
Input voltage : 2 Vrms
Input impedance : >10kΩ

Video - Cinch
Input voltage : 1 Vpp ± 3dB
Input impedance : 75 Ω

Video - YC (Hosiden)
Input voltage Y : 1Vpp ± 3dB
Input impedance Y : 75 Ω
Input voltage C : burst 300 mVpp ± 3 dB
Input impedance C : 75 Ω

1.6 Video Performance

All outputs loaded with 75 Ohm
SNR measurements over full bandwidth without weighting.

1.6.1 SCART (RGB)

SNR : > -65 dB on all output
Bandwidth : 4.8MHz ± 2dB

1.7 Audio Performance CD

1.7.1 Cinch Output Rear

Output voltage 2 channel mode	2Vrms ± 2dB
Channel unbalance (1kHz)	<1dB
Crosstalk 1kHz	>95dB
Crosstalk 20Hz-20kHz	>85dB
Frequency response 20Hz- 20kHz	±0.2dB max
Signal to noise ratio	>95 dB
Dynamic range 1kHz	>85dB
Dynamic range 20Hz-20kHz	>80dB
Distortion and noise 1kHz	>85dB
Distortion and noise 20Hz-20kHz	>75dB
Intermodulation distortion	>77dB
Mute	>95dB
Outband attenuation:	>40dB above 30kHz

1.7.2 Scart Audio

Output voltage 2 channel mode	1.6Vrms ± 2dB
Channel unbalance (1kHz)	<1dB
Crosstalk 1kHz	>85dB
Crosstalk 20Hz-20kHz	>70dB
Frequency response 20Hz- 20kHz	± 0.2dB max
Signal to noise ratio	>85 dB
Dynamic range 1kHz	>75dB
Dynamic range 20Hz-20kHz	>70dB
Distortion and noise 1kHz	>75dB
Distortion and noise 20Hz-20kHz	>65dB
Intermodulation distortion	>70dB
Mute (spin-up, pause, access)	>85dB
Outband attenuation:	>40dB above 25kHz

1.8 Digital Output

1.8.1 Coaxial

CDDA/ LPCM (incl MPEG1)	according IEC958
MPEG2, AC3 audio	according IEC1937
DTS	according IEC1937, amendment 1

1.9 Card Reader

IDE Interface ATA Card Reader
PC Card Standard Rev 8.0 Type I & II PCMCIA ATA Flash Memory Card Standard
Data transfer: 16.6MB/s max.
Support of all types of IDE Hard Disk Drives, Compact Flash Cards, Smart Media Cards / Smart Media ROM Cards, MMC Cards, SD Cards,

1.10 Digital Video Input (IEEE 1394)

1.10.1 Applicable Standards

Implementation according:
IEEE Std 1394-1995
IEC 61883 - Part 1
IEC 61883 - Part 2 SD-DVCR (02-01-1997)
Specification of consumer use digital VCR's using 6.3 mm magnetic tape - dec.1994
Mechanical connection according:
Annex A of 61883-1

1.11 P50 System Control

Via SCART pin nr 10

1.12 Dimensions and Weight

Height of feet	10mm
Apparatus tray closed	WxDxH :435 x 324.5 x 88cm
Apparatus tray open	WxDxH :435 x 366 x 88cm
Weight without packaging	app. 4 kg ± 0.5 kg
Weight in packaging	app. 6.5 kg

1.13 Laser Output Power & Wavelength

1.13.1 DVD

Output power during reading	0.8mW
Output power during writing	20mW
Wavelength	660nm

1.13.2 CD

Output power	0.3mW
Wavelength	780nm

2. Safety Information, General Notes

2.1 Description of the Production Number on the type plate

The type plate of the set contains a production number that consists of the following:

x	x														Site Code (Production center)
		x													BOM (Bill of Material) code
			x												Service version change code
				x	x	x	x								Production year/week code
								x	x	x	x	x	x		Serial number (6 digits)
V	N	1	A	0	3	4	2	1	2	3	4	5	6		Example code

2.1.1 The Site Code (Production center)

The site code consists of 2 letters and relates to the factory assembling and/or equipping the products. The site code letters valid for Consumer Electronics are stated in UAT-0477. The code is used to trace the production site of the model number,
e.g. VN...Szekesfehervar
KB...Hasselt
KT...SBI Electronics Shenzhen

2.1.2 BOM Code

The BOM code is used to link the model to the actual Bill Of Material used for assembly during set production. One set model can be made up of different standard designs / modules. This depends on the material availability in the production or the development progress of the successor modules. Different modules may be used during the same production period or changed back and forth from one week to the other.
BOM version 1 gets BOM code 1, BOM version 2 gets BOM code 2, etc. Allowed codes are 1-9, A-Z.

2.1.3 Service Version Change Code

The service version change code, which has to be recognizable for service and production departments, is used to indicate a production change that is considered as a major change affecting the "serviceability" of the product. A major change is occurring when a safety component is changed or when the servicer needs additional information to repair the set. E.g. when the software is changed or when an IC and its peripheral circuit are changed. Allowed characters are (A-Z, 0-9) to be used in the following sequence: A-Z followed by 0-9.

2.1.4 Production year/week code

Indicates the actual week of set assembly. Made up of the last two digits of year plus production week.

2.1.5 Serial number

The six digit serial numbers.

2.2 Safety Instructions

2.2.1 General Safety

Safety regulations require that during a repair:

- Connect the unit to the mains via an isolation transformer.
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:

- Route the wires/cables correctly, and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side:
  1. Unplug the mains cord, and connect a wire between the two pins of the mains plug.
  2. Set the mains switch to the 'on' position (keep the mains cord unplugged!).
  3. Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
  4. Repair or correct unit when the resistance measurement is less than 1 MΩ.
  5. Verify this, before you return the unit to the customer/user (ref. UL-standard no. 1492).
  6. Switch the unit 'off', and remove the wire between the two pins of the mains plug.

2.2.2 Laser Safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

Laser Device Unit

Type	:	Semiconductor laser GaAlAs
Wavelength	:	650 nm (DVD)
	:	780 nm (VCD/CD)
Output Power	:	20 mW (DVD+RW writing)
	:	0.8 mW (DVD reading)
	:	0.3 mW (VCD/CD reading)
Beam divergence	:	60 degree

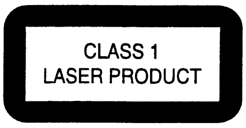


Figure 2-1

Note: Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

2.3 Warnings

2.3.1 General

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD, ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.

  - Wristband tester 4822 344 13999.
- Be careful during measurements in the live voltage section. The primary side of the power supply (pos. 1005), including the heatsink, carries live mains voltage when you connect the player to the mains (even when the player is 'off'!). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A 'lightning stroke' and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.
- Never replace modules, or components, while the unit is 'on'.

2.3.2 Laser

- The use of optical instruments with this product, will increase eye hazard.
- Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.
- Repair handling should take place as much as possible with a disc loaded inside the player.
- Text below is placed inside the unit, on the laser cover shield:

CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
VARNING SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN
VARO! AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LASER SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN
VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETSEN
DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
ATTENTION RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Figure 2-2

2.3.3 Notes

Dolby

Manufactered under licence from Dolby Laboratories. "Dolby", "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories. Confidential Unpublished Works. ©1992-1997 Dolby Laboratories, Inc. All rights reserved.

DOLBY SURROUND
PRO • LOGIC

Figure 2-3

Trusurround

TRUSURROUND, **SRS** and symbol (fig 2-4) are trademarks of SRS Labs, Inc. TRUSURROUND technology is manufactured under licence frm SRS labs, Inc.

Figure 2-4

Video Plus

"Video Plus+" and "PlusCode" are registered trademarks of the Gemstar Development Corporation. The "Video Plus+" system is manufactored under licence from the Gemstar Development Corporation.

VIDEO plus+®

Figure 2-5

Macrovision

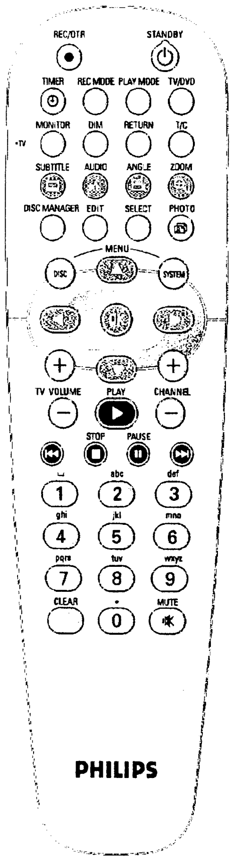
This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners.

Use of this copyright protection technology must be autorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

3. Directions For Use

Overview of functions

The remote control



REC/OTR ●	Record the current TV channel
STANDBY ⏻	To switch set on or off, interrupt menu function, interrupt a programmed recording (TIMER)
TIMER ⏲	To make a TIMER programming with/without ShowView® system or to alter/clear programmed recordings.
REC MODE	To select the picture quality/ maximum possible record time/
PLAY MODE	Choose between repeat, shuffle play and intro-scan
TV/DVD	Switches the scart socket **EXT2 AUX-I/O** of the DVD recorder directly to the TV set. This lets you watch the picture from any unit connected to this scart socket (set-top box', video recorder or satellite receiver) and at the same time record from another source. If you have not connected a device to the **EXT2 AUX-I/O** socket or the device is switched off, you can use this button to switch between TV reception and the signal of the DVD recorder. But this only works if you use a scart cable to connect the TV set to your DVD recorder (**EXT1 TO TV-I/O** socket) and your TV set responds to this switch-over.
MONITOR	This button lets you switch between disc playback or the picture of the internal tuner (TV channel).
DIM	This button lets you change the brightness of the display to one of two levels or switch it off.
RETURN	Return to previous menu on a video CD (VCD). This also works with some DVDs.
T/C	Choose the 'T'(Title)/'C'(Chapter) directly from the menu bar using ▼ , ▲ . If 'INFO' appears in the display, the index menu from a recorded disc or an introductory film will be shown. In this case, this function is not available.
SUBTITLE	Select the subtitle language
AUDIO	Selecting the audio language. For recording or during playback using the internal tuner (**MONITOR** key), select language 1 or 2.
ANGLE	Select the camera angle
ZOOM	Enlarge the picture
EDIT	For displaying the edit menu for DVD+RW/+R discs, for setting chapter markers, for editing the photos in the 'Digital Photo Manager'
SELECT	Select function/value/photos
PHOTO	Open the 'Digital Photo Manager'
DISC MENU	To show the DVD menu or the index screen, to leave the 'Digital Photo Mamger'
SYSTEM MENU	Call up/cancel the main menu (menu bar at the top of the screen)
▲ ▼	In den Menüs Cursortasten nach oben, unten.
◀ ▶	Cursor buttons left, right in the menus.
OK	Confirming of functions
PLAY ▶	Play back a recorded disc.
CHANNEL +	Next programme number

Overview of functions

CHANNEL –	Previous programme number
⏮	Briefly press the button during playback: Previous chapter or previous title Hold down the button: Search backwards Hold down the button during the still picture: slow motion backwards
STOP ■	Stop playback/recording, except with programmed recordings (TIMER) Hold down button, opens and closes the disc tray.
PAUSE ⏸	If this button is pressed during playback, the DVD recorder switches to pause. You will see a still picture. If this button is pressed during recording, the DVD recorder will also switch to pause.
⏭	Briefly press the button during playback: Next chapter or next title Hold down the button: Search forwards Hold down button during still picture, slow motion forwards
0..9	For entering numbers or characters at the corresponding entry fields.
CLEAR	To delete last entry or clear programmed recording (TIMER)
TV/MUTE 🔇	Switch TV sound on/off

Additional TV functions

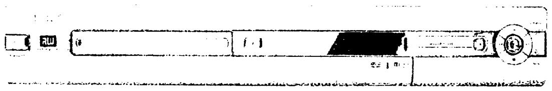
This will only work with TV sets with the same remote control code 'RC5) (e.g. Philips TV sets)

TV VOLUME +	Increase TV volume
TV VOLUME –	Reduce TV volume
TV/MUTE 🔇	Switch TV sound on/off

For the following functions you need to hold down the **• TV** button (on the left side) and then select the function you need with the appropriate button.

STANDBY ⏻	Switch on/off TV set
0..9	Number buttons 0 - 9
CHANNEL +	To select a higher programme number
CHANNEL –	To select a lower programme number

Overview of functions



ENGLISH

Front of the device

STANDBY-ON ⏻ : To switch device off / on, interrupt a function, interrupt a programmed recording (TIMER).

: Red light around the disc tray indicates recording on a DVD+RW/+R.

OPEN/CLOSE ▲ : Open/close disc tray.

MEDIA SLOT : Media Slot for PC (PCMCIA)-cards (adapters)

EJECT Eject PC-(PCMCIA) card

RECORD : Record the current TV channel

▶ : : Play back a recorded disc.

⏮ : select previous title/search backwards

⏭ : select next title/search forwards

■ : Interrupt playback/recording

Behind the flap at the right-hand corner on the front

S-VIDEO (CAM1) : Connection of SVHS/Hi8 camcorders or SVHS/Hi8 video recorders (programme number 'CAM 1')

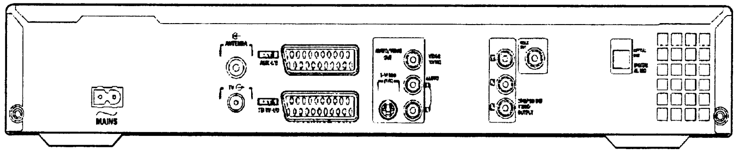
Yellow socket
VIDEO (CAM1) : **Video input socket**: Connection of camcorders or video recorders (programme number 'CAM 1')

White/red socket
AUDIO L/R (CAM1) : **Audio input socket left/right** : Connection of camcorders or video recorders (programme number 'CAM 1')

DV IN (CAM2) : digital video input (DV format only), IEEE 1394, FireWire to connecting a digital camcorder or other suitable device (programme number 'CAM2').

Switching between the sockets **VIDEO (CAM1)**, **S-VIDEO (CAM1)** *is done automatically. If a signal is available at both sockets at the same time, the signal at the* **S-VIDEO (CAM1)** *socket has priority.*
If you change the socket (unplug), you must re-select the socket. (Button **CHANNEL –** *and then* **CHANNEL +** *)*

Overview of functions



Back of the device

∿MAINS Connection to the mains supply (230V/50Hz)

ANTENNA IN Connection of the aerial

TV OUT Connection of the aerial cable to the TV set

EXT2 AUX-I/O Connection of an additional device (satellite receiver, set-top box, video recorder, camcorder, ...). Input for RGB, S-video signals, input/output for CVBS (video) signals

EXT1 TO TV-I/O Connection of a TV set. Input for RGB, S-video signals, input/output for CVBS (video) signals

Output sockets (AUDIO/VIDEO OUT)

S-VIDEO OUT (Y/C) Connection of an S-Video compatible TV set

VIDEO OUT (CVBS) Yellow cinch socket for the connection of a TV set with video input (CVBS, Composite Video).

AUDIO OUT L/R White/red cinch socket for the connection of a TV set with audio input sockets or an additional device.

COMPONENT VIDEO OUT **Component Video output (red/blue/green socket)**: Connection of an additional device with Component Video input (Interlaced/Progressive Scan)

Output sockets (DIGITAL AUDIO OUT)

COAX OUT
For the connection of a digital audio device using a coaxial cable(cinch cable).

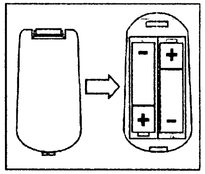
OPTICAL OUT
For the connection of a digital audio device using an optical cable (Toslink).

Connecting the DVD recorder

Preparing the remote control for operation

The remote control and its batteries are packed separately in the original DVD recorder packaging. You must install the batteries in the remote control before use - described in the following section.

❶ Take the remote control and the enclosed batteries (2 batteries).



❷ Open the battery compartment, insert the batteries as shown and then close the battery compartment. Match the polarities (+ and -) on the batteries with the diagram on the remote.

The remote control is now ready to use.
Its range is approximately 5 to 10 meters.

'Aim' correctly
Aim the remote control at the DVD recorder and not at the TV set.

Connecting to the aerial

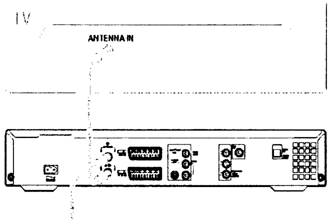
To receive TV programmes you have to connect the DVD-recorder to the aerial or the cable network.

❶ Switch off your TV set.

❷ Remove the aerial cable plug from your TV set. Insert it into the **ANTENNA IN** socket at the back of the DVD recorder.

❸ Insert one end of the supplied aerial cable into the **TV OUT** socket at the back of the DVD recorder and the other end into the aerial input socket at the back of the TV set.

The aerial input socket of the TV set may be labeled ANT IN, RF IN, 75 ohm, etc. Check your TV instructions for details.



Connecting the DVD recorder

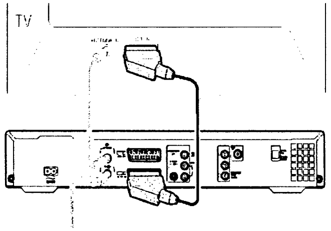
Connection with 'Easy Link'

Use this connection method if your TV set is equipped with 'Easy Link, Cinema Link, NexTView Link, Q-Link, Smart Link, Megalogic, Datalogic, ...'.
Please see your TV's operating instructions.

What is Easy-Link?
With the Easy Link function your DVD recorder can exchange information with your TV set. Your TV channels can also be transferred in the same order from your TV set to your DVD recorder.

❶ Switch off your TV set.

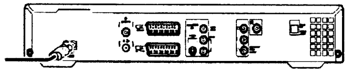
❷ Plug in a full-pin scart cable (all 21 contacts wired) into the scart socket **EXT1 TO TV-I/O** at the back of the DVD recorder and the corresponding scart socket - suitable for Easylink - at the back of the TV set (see TV set operating instructions).



O Read the next chapter 'Connecting additional devices' on how to connect additional devices (satellite receivers, videorecorders,...) to the input-/output sockets.

❸ Switch on the TV set.

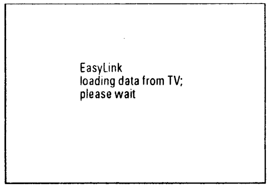
❹ Use the supplied mains cable to connect the mains socket **∿MAINS** at the back of the DVD recorder with the wall outlet.



→ The most important features of the DVD recorder will appear in scrolling text on the display.
After the first installation is completed this function will be switched off. How you switch on this function again, read in the chapter 'User preferences' in the section 'standby'.

❺ Switch on the DVD recorder using **STANDBY-ON ⏻**.

→ A message appears on the screen announcing that the transfer has started.



EasyLink
loading data from TV;
please wait

→ 'EASYLINK' appears on the display during transfer.

→ The TV set transfers all saved TV channels, in the same order, to the DVD recorder
This may take several minutes.

O If more installation menus appears on your TV set
- select the line with **▼**, **▲**.
- confirm with **▶**
- change the data with **▼**, **▲** or the number buttons **0..9**
- confirm with **OK**.

For more information on the various functions see 'Initial installation' in 'Installing your DVD recorder'.

Initial installation is now complete.

Connecting the DVD recorder

Connecting to the TV

If the function Easy Link is not supported from your TV set, choose from the following connection methods:

Connection with scart cable

Connection with S-videocable

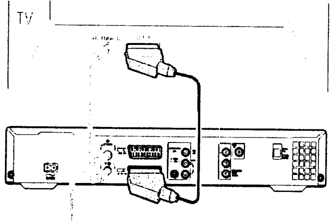
Connection with Video (CVBS) cable

Connection with the aerial cable only

Connection with scart cable

The scart or Euro AV cable serves as the universal connector for picture, sound and control signals. With this type of connection, there is practically no loss of quality in picture or sound transmission.

❶ Plug a scart cable into the scart socket **EXT1 TO TV-I/O** at the back of the DVD recorder and the scart socket for the DVD recorder at the back of the TV set (see TV set operating instructions).



Several scart sockets on the TV?

Select the scart socket that is suitable for both video output and for video input.

Selection menu for the scart socket?

On some TV sets select 'VCR' as the source for this scart socket. Read your instruction manual for your TV set for further information.

O Read the next chapter 'Connecting additional devices' on how to connect additional devices (satellite receivers, videorecorders,...) to the input-/output sockets.

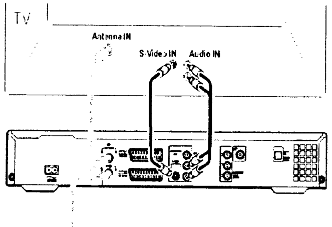
Then, read the chapter on 'Connecting to the mains'.

Connection with an S-Video(Y/C)cable

This connecting cable, also known as the SVHS cable, is used to transmit the brightness signal (Y signal) and colour signal (C signal) separately. This mini DIN socket/plug is also called a Hosiden socket/plug.

❶ Insert one end of an S-Video(SVHS) cable into the **S-VIDEO OUT (Y/C)** socket at the back of the DVD recorder and the other end into the S-Video (SVHS) input socket on the TV set (usually labelled 'S-Video in' or 'SVHS in'. See TV operating instructions).

❷ Insert one end of an audio (Cinch) cable into the red/white Cinch socket **AUDIO OUT L/R** at the back of the DVD recorder and the other end into the audio input socket (usually red/white) on the TV set (usually labelled 'Audio in' or 'AV in'. See TV operating instructions).



O Read the next chapter 'Connecting additional devices' on how to connect additional devices (satellite receivers, videorecorders,...) to the input-/output sockets.

Then, read the chapter on 'Connecting to the mains'.

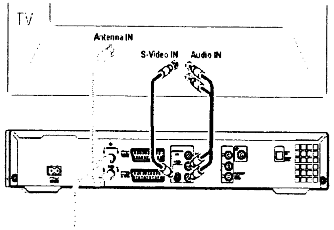
Connecting the DVD recorder

Connection with video (CVBS) cable

This cable, usually with yellow Cinch connectors, is used for transmitting the Composite Video signal (FBAS, CVBS). In this method of transmission the colour signal and the brightness signal are transmitted on the same cable. In certain circumstances, this can lead to slight problems with the picture, such as 'Moiré' patterns.

❶ Insert one end of a video (CVBS) cable into the yellow Cinch socket **VIDEO OUT (CVBS)** at the back of the DVD recorder and the other end into the video input socket (usually yellow) on the TV set (usually labelled 'Video in' or 'AV in'. See TV operating instructions).

❷ Insert one end of an audio (Cinch) cable into the red/white Cinch socket **AUDIO OUT L/R** at the back of the DVD recorder and the other end into the audio input socket (usually red/white) on the TV set (usually labelled 'Audio in' or 'AV in'. See TV operating instructions).



O Read the next chapter 'Connecting additional devices' on how to connect additional devices (satellite receivers, videorecorders,...) to the input-/output sockets.

Then, read the chapter on 'Connecting to the mains'.

Connection with the aerial cable only

To connect this DVD-Recorder to a TV set without external Audio/Video input sockets, you need a modulator. With the modulator the audio/video signal is converted in an UHF-channel. This signal can be received and stored on the TV as a TV-station.

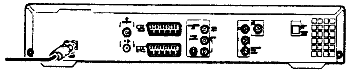
Connecting to the mains

ENGLISH

Always check if the local mains voltage matches the voltage range printed on the type plate at the back or bottom of the DVD-recorder. If not consult your dealer or the customer support from your country.

❶ Switch on the TV set.

❷ Insert one end of the supplied mains cable into the mains socket **∿MAINS** at the back of the DVD recorder and the other end into the wall socket.



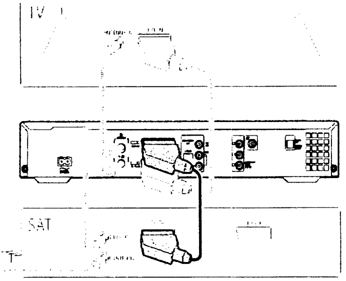
→ The most important features of the DVD recorder will appear in scrolling text on the display.

After the first installation is completed this function will be switched off.

Then, read the paragraph on 'Initial installation' in 'Installing your DVD recorder'.

Connecting additional devices

Connecting additional devices to the second scart socket



You can connect additional devices such as decoders, satellite receivers, camcorders, etc. to the **EXT2 AUX-I/O** socket.

When playback is started on this additional device the DVD recorder automatically connects the **EXT2 AUX-I/O** scart socket with the **EXT1 TO TV-I/O** scart socket. You will then see the picture from the additional device on your TV set, even if the DVD recorder is switched off.

○ The **TV/DVD** button on the remote control allows you to switch between playback through the **EXT2 AUX-I/O** scart socket and playback from the DVD recorder.

Connecting a video recorder, DVD player.

You can also connect a video recorder or a DVD player to the **EXT2 AUX-I/O** input socket.
The DVD recorder must be connected **directly** to the TV set (**EXT1 TO TV-I/O** socket directly to the TV set). If there is a video recorder in between the picture quality may be poor because of the copy protection system built into the DVD recorder.

○ If you already have an external receiver (satellite receiver, set-top box, cable TV box) connected to this socket, you can connect the video recorder to the 'VCR', 'TO VCR', ...socket of the external receiver.

○ You can also use the front sockets **S-VIDEO (CAM1)**, **VIDEO (CAM1)** and the **AUDIO L/R (CAM1)** audio sockets.

Connecting an external receiver

❶ Connect the **scart socket** of the receiver (satellite receiver, set-top box, cable TV box,...) provided for the TV set (usually labelled 'TV', 'TO TV',...) with the **EXT2 AUX-I/O** socket of the DVD recorder.

○ If your external receiver offers several options for the signal available at the 'TV', 'TO TV',... socket, choose the 'RGB' setting.

__Why can't I use the 'VCR', 'TO VCR',... socket?__
In order to achieve the best possible picture quality, you must use the RGB (red-green-blue) signal of the receiver. As a rule, this signal is available at the 'TV', 'TO TV',... socket. The DVD recorder transfers the signal to the **EXT1 TO TV-I/O** *socket.*
Some receivers only provide a 'Video (CVBS/FBAS)' signal at the 'VCR', 'TO VCR'...socket.
If you are satisfied with the picture quality of the 'VCR', 'TO VCR',... socket, you can also use this socket.
Read the instruction manual of the receiver which signals are available at the sockets.

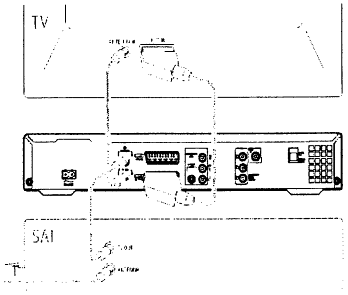
__Connecting additional receivers__
For additional receivers, you can also use the **EXT1 TO TV-I/O** *socket (if the TV set is connected to the* **COMPONENT VIDEO OUT** *sockets), and* **VIDEO (CAM1)**, **S-VIDEO (CAM1)** *sockets at the front. Please observe that you also have to connect an audio cable to the* **AUDIO L/R (CAM1)** *socket.*

Connecting additional devices

Connecting additional devices only via aerial cable

If you want to connect additional devices (e.g. satellite receiver...) only via aerial cable, please observe the following:

The DVD-Recorder must be connected directly to the TV set. If there is a video recorder or an additional device in between, the picture quality may be poor because of the copy protection system built into the DVD-Recorder.



The additional device (satellite receiver) must be connected **before the** DVD recorder (additional device - DVD recorder - TV set). Only the TV set must be connected to the **TV OUT** socket.

If there is interference in the picture when the additional device is switched on, a TV broadcaster may be transmitting on the same channel or a channel very close to that of the additional device. (e.g.: TV broadcaster on channel 45, additional device (satellite receiver) also on channel 45). In this case, change the channel of the additional device (satellite receiver). Consult the instruction manual of the additional device.
You must also store this channel on the DVD recorder to be able to record TV programmes from the additional device (satellite receiver).

Switch on the additional device during the installation of the DVD recorder. During the automatic channel search, the channel on which the additional device is transmitting will be stored as a TV channel.

Connecting a camcorder to the front sockets

To copy camcorder recordings, you can use the front sockets. These sockets are located behind the flap on the right hand side.

Digital (DV) input socket

If you have a DV or Digital 8 camcorder, connect the **DV IN (CAM2)** input of the DVD recorder to the appropriate DV output on the camcorder.
Choose 'CAM2' as a programme number for this input.

During recording on a DVD+RW/+R the original recording date and time are stored as DVD subtitles.
On playback, this data can be displayed on the TV screen by using the ⎕ *' function (Subtitle).*

S-video input socket

If you have a Hi8 or S-VHS(C) camcorder, connect the **S-VIDEO (CAM1)** input of the DVD recorder to the appropriate S-VHS output on the camcorder.
You must also connect the audio input **AUDIO L/R (CAM1)** on the DVD recorder to the audio output on the camcorder.

Choose 'CAM1' as a programme number for this input.

Video (CVBS) input socket

If you have a camcorder that only has a single video output (Composite Video, CVBS), connect the **VIDEO (CAM1)** input on the DVD recorder to the appropriate output on the camcorder.
You must also connect the audio input **AUDIO L/R (CAM1)** on the DVD recorder to the audio output on the camcorder.

Choose 'CAM1' as a programme number for this input.

Connecting audio devices to the analogue audio sockets

Two analogue audio sockets **AUDIO OUT L/R** (audio signal output left/right) are located at the back of the DVD recorder.

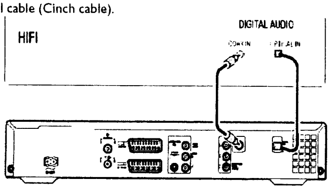
These can be used to connect the following:
•) a receiver with Dolby Surround Pro Logic
•) a receiver with two-channel analogue stereo

__Can I use the 'Phono' input on my amplifier?__
This socket (input) on the amplifier is designed only for a record player without preamplifiers. Do **not** *use this input for connecting the DVD recorder.*
The DVD recorder or the amplifier may be damaged as a result.

Connecting additional devices

Connecting audio devices to the digital audio sockets

At the back of the DVD recorder there are two digital audio output sockets **OPTICAL OUT** for an optical cable and **COAX OUT** for a coaxial cable (Cinch cable).



These can be used to connect the following:

•) **an A/V receiver or an A/V amplifier with a digital multi-channel sound decoder**

•) **a receiver with two-channel digital stereo (PCM)**

Digital multi-channel sound

Digital multi-channel sound offers the best possible sound quality. You will need a multi-channel A/V receiver or amplifier that supports at least one of the audio formats of the DVD recorder (MPEG2 and Dolby Digital).

Consult the operating instructions for your receiver to find out which audio formats it supports.

× ***All I can hear from my loudspeakers is a loud distorted noise***

✓ *The receiver is not compatible with the digital audio format of the DVD recorder. The audio format of the DVD disc is displayed in the status window when you switch to another language. Playback in six-channel digital surround sound is only possible if the receiver has a digital multi-channel sound decoder.*

Installation

Initial installation

After successfully connecting your DVD recorder to the TV set and other additional devices as described in the previous chapters, this chapter will show you how to start the initial installation. The DVD recorder automatically seeks and stores all available TV channels.

Switching on additional devices

If you have connected additional devices such as a satellite receiver to the aerial cable, switch them on. The automatic channel search will recognise it and save it. Please observe that you must switch on a "test signal" for some additional devices.

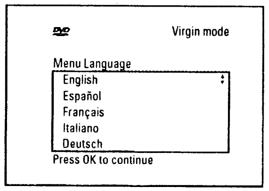
No aerial connected

Even if you only want to use the DVD recorder to play back or have only connected a satellite receiver, you must still complete the initial installation. This is necessary so that the basic settings are stored correctly. Once initial installation is complete you can use the DVD recorder as normal.

❶ Press **STANDBY-ON** ⏻ on the front of the DVD-recorder

→ 'PHILIPS' and then 'IS TV ON?' will appear on the display.

→ If the connection was properly made and your TV was **automatically switched** to the programme number for the input socket, e.g. 'EXT', '0', 'AV', you will see the following picture:



Virgin mode

Menu Language
English
Español
Français
Italiano
Deutsch
Press OK to continue

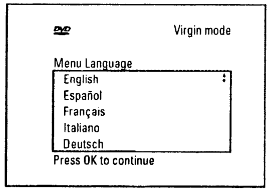
× ***My screen is empty.***

✓ *Depending on the initialisation procedure it can take some time before the picture appears. Please press* ***no button*** *in the meantime.*

✓ *If the TV set does not automatically switch to the programme number of the input socket, select the corresponding programme number on your TV set manually (see your TV's operating instructions).*

✓ *Check that the scart cable is connected from the TV set to the* **EXT1 TO TV-I/O** *socket on the DVD recorder. The* **EXT2 AUX-I/O** *socket is intended only for additional devices.*

❷ Select the desired language for the on-screen menu by pressing ▼ or ▲ .



Virgin mode

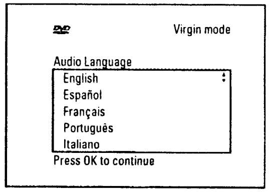
Menu Language
English
Español
Français
Italiano
Deutsch
Press OK to continue

What is an on-screen menu?

All settings and/or functions are displayed on your TV screen in the relevant language.

❸ Confirm with **OK** .

❹ Select the desired audio language using ▼ or ▲ .



Virgin mode

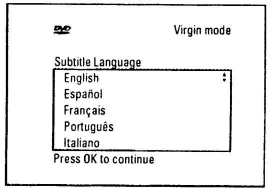
Audio Language
English
Español
Français
Português
Italiano
Press OK to continue

What is an audio language?

The DVD will play the sound in the language you select, provided this language is available on the disc. If it is not available on the disc the first language on the DVD will be used instead. The DVD Video Disc menu, if available, will also be displayed in the language you select.

❺ Confirm with **OK** .

❻ Select the desired language for the subtitles by pressing ▼ or ▲ .



Virgin mode

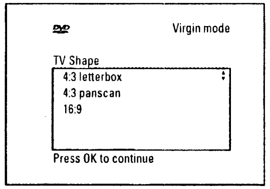
Subtitle Language
English
Español
Français
Português
Italiano
Press OK to continue

What is the subtitle language?

The subtitles will be displayed in the language you select, provided this language is available on the disc. If it is not available on the disc the fist language on the DVD will be used instead.

⑦ Confirm with **OK** .

⑧ Select the desired screen format position using ▼ or ▲ .



Virgin mode

TV Shape

4:3 letterbox

4:3 panscan

16:9

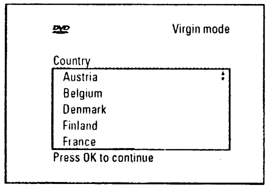
Press OK to continue

- O *'4:3 letterbox'*
  for a 'wide-screen' (cinema format) picture with black bars at the top and bottom.
- O *'4:3 panscan'*
  for a full-height picture with the sides trimmed.
- O *'16:9'*
  for a wide-screen TV set (screen edge ratio 16:9)

⑨ Confirm with **OK** .

⑩ Select the country of your residence with ▼ or ▲ .

- O If your country does not appear, select *'Other'*.



Virgin mode

Country

Austria

Belgium

Denmark

Finland

France

Press OK to continue

Why do I have to set the country?

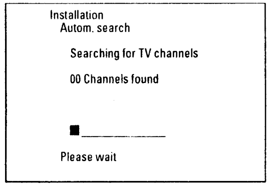
To call up the specific settings for the respective country, you must first install the country.

⑪ Confirm with **OK** .

→ A screen appers with a message about the connection of the aerial.
It can take some time before this screen appears. Please press **no button** in the meantime.

⑫ After you connect the aerial (or cable TV, satellite receiver, etc.) to the DVD recorder, press **OK** .

→ The automatic TV channel search starts.



Installation

Autom. search

Searching for TV channels

00 Channels found

Please wait

→ *'WAIT'* will appear on the display.
Wait until all available TV channels have been found. This can take several minutes.

× ***No TV-Stations found yet?***

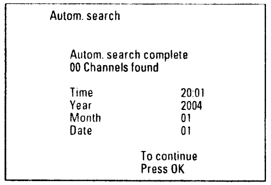
✓ *Select channel 1 on the TV set. Can you see the stored TV channel on the TV set?*
If not, check the cable connection from the aerial (aerial socket) to the DVD recorder and to the TV set.

✓ *Please have patience.*
The DVD recorder searches the entire frequency range in order to find and save the largest possible number of TV channels.

✓ *If you have not connected an aerial, go through all the basic settings right to the end and then, if you wish, start the automatic search (see 'Automatic TV channel search').*

→ When the automatic TV channel search is complete, '***Autom. search complete***' will appear on the TV screen along with the number of TV channels found.

→ '***Time***', '***Year***', '***Month***', '***Date***' will then appear on the TV screen. It can take some time before this screen appears. Please press **no button** in the meantime.



Autom. search

Autom. search complete

00 Channels found

Time	20:01
Year	2004
Month	01
Date	01

To continue

Press OK

⑬ Check the displayed settings for '***Time***', '***Year***', '***Month***' and '***Date***' .

- O If required, change the data with the number buttons **0..9** on your remote control.
- O Select the line with ▲ or ▼ .

⑭ If all informations are correct, save by pressing **OK** .

The initial installation is now complete.
How to modify the channel settings or the time/date settings you will red on the following chapter.

× ***Sound may be distorted on some TV channels.***

✓ *If the sound is distorted on any of the stored TV channels or if there is no sound at all, the wrong TV system may have been stored for the TV channel. Read 'Manual TV channel search' for information on how to change the TV system.*

Using a satellite receiver

TV channels from a satellite receiver (connected to scart socket **EXT2 AUX-I/O**) are received on the DVD recorder on programme number ***'EXT2'***

If necessary, use the **MONITOR** button to switch to the internal tuner.
Select programme number ***'EXT1'*** with **0** on the remote control and then select programme number ***'EXT2'*** with **CHANNEL –** .
You should select the TV channels to be received by the satellite receiver directly on the receiver itself.

Additional installation features

Allocating a decoder

Some TV channels send coded TV signals that can only be viewed properly with a purchased or rented decoder. You can connect such a decoder (descrambler) to your DVD recorder. The following function automatically activates the connected decoder for the TV channel you want to watch.

If your TV set supports 'Easy Link' the decoder must be assigned to the relevant TV channel on the TV set (see the operating instructions for your TV set). Settings cannot then be made in this menu.

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

① Use the **CHANNEL +** and **CHANNEL –** buttons or the number buttons **0..9** on the remote control to select the TV channel for which you want to use the decoder.
  ○ If necessary, use the **MONITOR** button to switch to the internal tuner.

② Press the **SYSTEM MENU** button on the remote control.
  → The menu bar appears.

③ Select 'TA' symbol with ◄ or ► .

④ Select '***Installation***' using ▼ or ▲ and confirm with ► .

⑤ Select '***Manual search***' using ▼ or ▲ and confirm with ► .

```
Installation
  Manual search

    Channel/freq.      CH
    Entry/search       01
    Programme number   01
    TV channel name    BBC1
    Decoder            Off
    TV system          PAL-BG
    NICAM              On
    Fine tuning        0
                            To store
                            Press OK
```

⑥ Select '***Decoder***' using ▼ or ▲ .

⑦ Select '***On***' with ► .
  ○ To switch off the decoder use ► to select '***Off***' (Decoder switched off).

⑧ Confirm with **OK** .

⑨ To end, press **SYSTEM MENU** .

Your decoder has now been allocated to this TV channel.

Connection using a component video (Y Pb Pr/YUV) cable

Component video (Y Pb Pr) is the highest quality picture transmission option. This is achieved by dividing the video signal into a luminance signal (Y) and two colour difference signals - red minus luminance (V) and blue minus luminance (U). As a rule, "Cr, Pr" or "R-Y" is used to describe the red difference signal and "Cb, Pb" or "B-Y" the blue difference signal.
These signals are transmitted through separate lines. The connectors of this cable and the corresponding sockets are usually green (luminance, Y), blue (U, Pb, Cb, B-Y), and red (V, Pr, Cr, R-Y).

Attention!
If you choose this type of connection, the DVD recorder must already be connected and completely installed (initial installation complete). Switching of the signal to the **COMPONENT VIDEO OUT** sockets is carried out in a menu that is not yet available during the initial installation.

① Press the **SYSTEM MENU** button on the remote control.
  → The menu bar appears.

② Select 'TA' symbol with ◄ or ► .

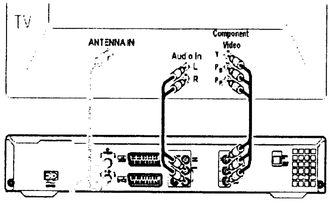
③ Select the '▣' symbol using ▼ or ▲ and confirm with ► .

④ Select the line '***Component video output***' using ▼ and confirm with ► .

⑤ Select the setting you need with **SELECT** . Choose '***Progressive Scan***' only if your TV has Progressive Scan.

⑥ Confirm with **OK** .

For more information on the other settings, read section 'Picture settings' ('***Video output***') in chapter 'User preferences'.



⑦ Use a component video (Y Pb Pr) cable, connect the three cinch sockets (red, blue, green) **COMPONENT VIDEO OUT** at the back of the DVD recorder with the corresponding three component video (progressive scan) input sockets of your TV set, usually labelled 'Component Video Input', 'YUV Input', 'YPbPr', 'YCbCr' or simply 'YUV'.

Warning!
Do not confuse these sockets with the five-component RGB sockets (if available) or the yellow video (CVBS/FBAS) socket and the two audio sockets (red/white). The five-component RGB sockets are only provided for the R-G-B-H-V signals (red, green, blue with horizontal and vertical synchronisation impulse).

Additional installation features

Please observe the colour sequence
The colours of the sockets at the DVD recorder and the connectors must match those of the socket colours at the TV set (red-red/blue-blue/green-green). If they don't, the colours of the picture may get mixed up or the picture may not be visible.

⑧ Use an audio (cinch) cable, connect the red/white cinch socket **AUDIO OUT L/R** at the back of the DVD recorder with the most coloured red/white audio input socket of your TV set (usually labelled 'Audio in' or 'AV in'. See the instruction manual of your TV set.)

⑨ If necessary, switch the TV set to the component video (Progressive Scan) input sockets. If there is a switch or selection on your TV-set between 'Interlaced' and 'Progressive scan' select 'Progressive scan'.
You may need to refer to your TV operating instructions.

  → The menu of the DVD recorder should now appear on the TV screen. If not, check the cable connections and the settings on your TV set.

  ○ If necessary store this setting on your TV set.

⑩ End with **SYSTEM MENU** .

Manual TV channel search

In some cases, not all of the available TV channels may have been found and stored during initial installation. In this case, you will need to search for and store the missing or coded TV channels manually.

With 'Easy Link', the DVD recorder will automatically download the TV channels stored on the TV set. This is why some lines have no function. To store new TV channels, they must first be stored on the TV set. The information will then be transferred to the DVD recorder automatically.

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

① Press the **SYSTEM MENU** button on the remote control.
  → The menu bar appears.

② Select 'TA' symbol with ◄ or ► .

③ Select '***Installation***' using ▼ or ▲ and confirm with ► .

④ Select '***Manual search***' using ▼ or ▲ and confirm with ► .

```
Installation
  Manual search

    Channel/freq.      CH
    Entry/search       01
    Programme number   01
    TV channel name    BBC1
    Decoder            Off
    TV system          PAL-BG
    NICAM              On
    Fine tuning        0
                            To store
                            Press OK
```

⑤ In '***Channel/freq.***', select the desired display using ► . '***Freq.***'(Frequency), '***CH***'(Channel), '***S-CH***'(Special/hyperband channel)

⑥ In '***Entry/search***', enter the frequency or channel of the TV station using the number buttons **0..9** .
  ○ Press ► in the line '***Entry/search***' to start the automatic search.
  → A changing channel number/frequency number will appear on the TV screen.

  Continue the automatic search until you have found the TV channel you are looking for.

⑦ Using ◄ or ► in '***Programme number***', select the programme number you want to use for the TV channel, e.g. '***01***'.

⑧ Press **OK** to store the TV channel.

⑨ To search for other TV channels, begin again at ⑥ .
  ○ **Change the name of a TV channel:**
    - In '***TV channel name***', press ► .
    - Select the desired character position using ◄ or ► .
    - hange the character at the desired position with ▼ or ▲ .
    - Select the next character position in the same way.
    - Confirm with **OK** .

  ○ **Change the TV system of the TV channel:**
    - In '***TV system***', use ◄ or ► to select the TV system that produces the least distortion of picture and sound.

  ○ **NICAM**
    - If reception is poor and the sound distorted you can turn off NICAM.
    In '***NICAM***', select '***Off***' using ► .

  ○ **Fine tuning**
    - You can try fine tune the TV channel manually with ◄ , ► in the line '***Fine tuning***'.

⑩ To end, press **SYSTEM MENU** .

Sorting TV channels automatically (Follow TV)

This function changes the order of the TV channels stored in your DVD recorder to match the order on the TV set.
This only works if the DVD recorder (**EXT1 TO TV-I/O** socket) and the TV set **are connected with a scart cable.**

If your TV set supports 'Easylink...', TV channels will be stored during initial installation in the same order as they appear on the TV set. To store the TV channels in a different order, you'll need to change the order on the TV set. When you start the Follow TV function the information is transferred again from the TV set.

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menu bar appears.

❷ Select '🛠' symbol with ◀ or ▶ .

❸ Select '***Installation***' using ▼ or ▲ and confirm with ▶ .

❹ Select line '***Follow TV***' with ▼ or ▲ . and confirm with the ▶ button.

❺ Confirm the message on the screen with **OK** .
→ 'TV 01' will appear in the DVD recorder display.

❻ Select programme number '1' **on the TV set**.

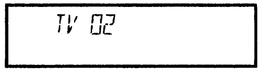
× ***I cannot switch my TV set to programme number '1'***
✓ *If you have connected additional devices to the* **EXT2 AUX-I/O** *socket, please disconnect these devices. Other connected devices may have switched the TV set to the programme number of the scart socket.*

❼ Confirm with **OK** on the DVD recorder remote control.
→ 'WAIT' will appear in the display.

→ The DVD recorder compares the TV channels on the TV set and the DVD recorder.
If the DVD recorder finds the same TV channel as on the TV set it stores it at 'P01'.

× ***'NOTV' will appear in the display.***
The DVD recorder is not receiving a video signal from the TV set.
✓ *Chech the connectors at both ends of the scart cable.*
✓ *Check your TV's operating instructions to see which scart socket is used for video signals.*
✓ *If the problem persists, you won't be able to use this feature. Please read 'Sorting and deleting TV channels manually'.*

❽ Wait until for example 'TV 02' appears in the display.



❾ Select the next programme number **on the TV set**, e.g. '2'.

❿ Confirm with **OK** on the DVD recorder remote control.
O If you confirmed the wrong TV channel, you can delete the last allocation with ◀ .

⓫ Repeat steps ❽ to ❿ until you have assigned all the TV channels from your TV set.

⓬ To end, press **SYSTEM MENU** .

Automatic TV channel search

If the channel assignments of your cable or satellite TV provider change or if you are reinstalling the DVD recorder, e.g. after moving house, you can start this procedure again. This will replace the stored TV channels with the new ones.

My TV set has Easylink
With Easylink, you can search for and store TV channels only on the TV set. These settings are accepted by the DVD recorder. Use this function to start the transfer of TV channels from the TV set.

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menubar appears on the screen.

❷ Select the '🛠' icon using ◀ or ▶ .

❸ Select '***Installation***' using ▼ or ▲ and confirm with ▶ .

❹ To end, press **SYSTEM MENU** .

You can read about how to search for a TV channel manually in 'Manual TV channel search'.

Sorting and deleting TV channels manually

With this function you can rearrange the TV channels already stored or to delete TV channels you don't want or those with poor reception.

EasyLink
With Easylink, you can search for and store TV channels only on the TV set. These settings are then transferred to the DVD recorder. That is why you cannot select this function manually.

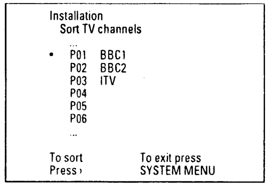
Preparation:
•) The TV set is switched on, and if necessary, the programme number for the DVD recorder has been selected.
•) the DVD recorder is switched on.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menubar appears on the screen.

❷ Select the '🛠' icon using ◀ or ▶ .

❸ Wählen Sie mit der Taste ▼ oder ▲ die Zeile '***Installation***' und bestätigen Sie mit der Taste ▶ .

❹ Select '***Sort TV channels***' using ▼ or ▲ and confirm with ▶ .


```
Installation
  Sort TV channels

•  P01  BBC1
   P02  BBC2
   P03  ITV
   P04
   P05
   P06
   ...

To sort          To exit press
Press›           SYSTEM MENU
```

❺ Using ▼ or ▲ select the TV channel that you want to delete or whose order you want to change.

❻ Confirm with ▶ .
O **Deleting TV channels**
Unwanted channels or those with poor reception can be deleted using **CLEAR** .

❼ Using ▼ or ▲ , shift the TV channel to the desired position and press the ◀ button.
→ The DVD recorder will insert the TV channel.

❽ Repeat steps ❺ to ❼ until you have resorted/deleted all the TV channels you want.

❾ To store, press **OK** .

❿ To end, press **SYSTEM MENU** .

Setting the language/country

You can select the country and, for the basic setting of DVD playback, the language for the subtitles and the audio language.

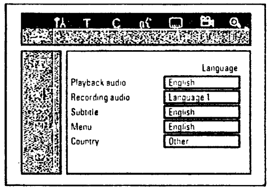
Please note that with some DVDs the audio language and/or subtitle language can be changed only via the DVD menu.
For bilingual shows, you can also select the sound channel of the TV station via the internal tuner (**MONITOR** button) for recording or playback.

Preparation:
•) The TV set is switched on, and if necessary, the programme number for the DVD recorder has been selected.
•) the DVD recorder is switched on.

❶ Press **SYSTEM MENU** on the remote control.
→ The menu bar appears.

❷ Select '🛠' symbol with ◀ or ▶ .

❸ Select '🗨' with ▼ or ▲ and confirm with the ▶ button.



Playback audio	English
Recording audio	Language 1
Subtitle	English
Menu	English
Country	Other

❹ Select the appropriate line and confirm with ▶ .
O ***Playback audio***
The DVD will play back in the language you have chosen.

O '***Subtitle***'
Subtitle language

O '***Menu***'
You have the option of setting one of the displayed languages for the on-screen menu (OSD). However, the DVD recorder display will only display English text regardless of this setting.

❺ Select the appropriate setting using ▼ or ▲ and confirm with **OK** .

❻ To end, press **SYSTEM MENU** .

Additional installation features

Setting the time and date

If the display shows an incorrect time or '--:--', the time and date must be reset manually.

SMART CLOCK

'SMART CLOCK' automatically sets the time and date using the information transmitted by the TV channel. Normally the TV channel stored at programme number 'P01' is used. In the ***'Clock preset'*** *line you can select the programme number (channel name) whose TV channel transmits this information.*

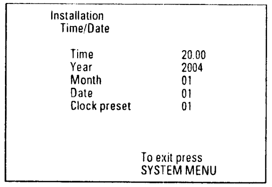
If the time/date is not displayed correctly you need to choose the ***'Off'*** *setting in the* ***'Clock preset'*** *line and set the date and time manually.*

❶ Press **SYSTEM MENU** on the remote control.
→ The menu bar appears.

❷ Select 'TA' symbol with ◄ or ► .

❸ Select '***Installation***' using ▼ or ▲ and confirm with ► .

❹ Select '***Time/Date***' using ▼ or ▲ and confirm with ► .



```
Installation
  Time/Date

   Time              20.00
   Year              2004
   Month             01
   Date              01
   Clock preset      01


                 To exit press
                 SYSTEM MENU
```

❺ Change the time in '***Time***' using the number buttons **0..9** on your remote control.

❻ Check '***Year***', '***Month***' and '***Date***' in the same way. Select the entry field with the ▼ or ▲ button.

× *Time/date is displayed incorrectly despite manual setting*
✓ *With 'SMART CLOCK', time/date is transferred from the TV channel saved on 'P01' and automatically corrected.*
You can either enter another TV channel for transferring the data or disable the function.
In the line ***'Clock preset'*** *select the relevant TV channel with ◄ or ► . To disable, select* ***'Off'***.

❼ Check the displayed settings and confirm with **OK** .
→ '***Stored***' will appear briefly on the screen.

❽ To end, press **SYSTEM MENU** .

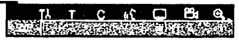
Information on the screen of your TV

You can check or change many of the functions and settings of your DVD recorder via the system menu bar. The menu bar cannot be displayed during recording.

Symbols in the menu bar

Press **SYSTEM MENU** to open and close the menu bar (main menu).
Use ◄ and ► to select the relevant function.
Use ▼ to confirm the function and go either to another menu or execute the function directly.
Some functions may not be available, depending on the disc inserted.

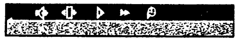
Menu bar 1



- **User preferences**
- **Title/track**
- **Chapter/index**
- **Audio language**
- **Subtitle language**
- **Camera angle**
- **Zoom**

Menu bar 2

While menu bar 1 is being displayed you can go to menu bar 2 by pressing ► again.



- **Sound**
- **Frame advance**
- **Slow motion**
- **Fast motion**
- **Search by time**

Field for temporary messages

The top left corner of the menu line contains a field for temporary messages relating to the various operating modes. This information appears briefly on the screen when certain disc functions have been activated:

- **Shuffle**
- **Scan**
- **Repeat entire disc**
- **Repeat title**
- **Repeat track**
- **Repeat chapter**
- **Repeat from A to the end**
- **Repeat from A to B**
- **Camera angle**
- **Child lock enabled**
- **Resume playback**
- **Illegal action**

Status field

The status field shows the current operating mode (status) of the DVD recorder and the type of disc inserted. This display can be switched off.

Disc type symbols

- **DVD+RW**
- **DVD+R**
- **DVD-Video**
- **Video-CD**
- **No disc**
- **Error**

Information on the screen of your TV

Operating mode symbols

Recording

Stop

Playback

Playback-Pause

Record-Pause

Search forwards (8x speed)

Search backwards (8x speed)

Slow motion

Tuner information box

This field is located in the bottom left-hand corner of the screen. The aerial signal, the TV channel and the TV channel name for the selected programme are displayed.

Current channel/selected input socket

x **No signal**
The TV channel is not available/the additional device is not connected or it is switched off

Copy-protected signal

'Live picture' in the 'Tuner information box'

Instead of the information about the aerial signal or the TV channel, you can watch the picture of the selected TV channel or the signal on the input socket.

1. In the system menu (button **SYSTEM MENU**) select the symbol '' and confirm with ▶
2. In the line '*Live source view*' select '*On*' to view this picture or '*Off*to switch this picture off.
3. End with **OK** and then **SYSTEM MENU** .

Timer information box

This box appears above the tuner information box. When a timer recording is set, it shows the timer icon and the start time or date of the first programme to be recorded.
If no timer recording is scheduled, the current time is displayed.
This box disappears during playback of a disc or after a recording starts. However, you can access it during an OTR recording by pressing **SYSTEM MENU** .

! Timer starts on the day/time shown

OTR recording runs until the stop time displayed

Current time
No timer event programmed

Playback

General notes on playback

With this DVD recorder you can play back the following systems:
- •) DVD Video
- •) (Super)Video CD Disc
- •) DVD+RW Disc
- •) DVD+R Disc
- •) DVD-RW (video mode, finalised)
- •) DVD-R
- •) CD-R
- •) CD-RW
- •) Audio CD
- •) MP3-CD
- •) Picture -CD (JPEG-data)

You can operate the video recorder using the remote control or the buttons on the front of the DVD recorder.

× ***The display will read 'PIN'***
✓ *The child lock has been activated for the inserted disc. Read the sections on 'Child lock' and 'Releasing a disc' in the chapter on 'Access control (child lock).*

× ***The menu on the screen is showing an 'X'***
✓ *Some DVD discs can be manufactured so that certain steps are required before the disc can be played, or so that only limited operation is possible during playback. When an 'X' appears on the screen the selected feature is not possible.*

× ***The screen is showing regional code information***
✓ *Since DVD films are not normally released in all parts of the world at the same time, all DVD players have a specific regional code. Discs can be given a regional code. If the regional codes differ between the player and the disc, playback is not possible.*
✓ *The regional code is shown on the label on the back of the machine.*
✓ *The regional code does not apply to recordable DVDs.*

× ***I can see the message 'EMPTYDISC'***
✓ *The disc does not contain any recordings.*

× ***'DISC ERR' will appear on the display***
✓ *Recording could not be completed correctly because of a disc error. Check the disc and clean it if necessary.*

× ***A dialog box appears asking you whether you want to delete the contents or eject the disc***
✓ *The disc inserted is a DVD+RW but its contents are not DVD video-compatible (e.g. a data disc). Recordings on this disc can only be made if the entire disc is first deleted with the* **REC/OTR ●** *button.*

Inserting a disc

1. Press the **OPEN/CLOSE ▲** button on the front.

OPENING
P01

→ The disc tray will open. While the disc tray is opening, the display shows 'OPENING' and then 'TRAY OPEN' when the tray is fully open.

2. Carefully place the disc in the tray with the label facing up and press **PLAY ▶** or **OPEN/CLOSE ▲** .
   → 'CLOSING' and then 'READING' will appear in the display. The information on the disc will be read.

How do I insert a double-sided DVD?

Double-sided discs do not have labelling over the whole surface. The labelling for each side is in the centre of the disc. To play a side its label must be facing up.

Opening/closing the tray using the remote control

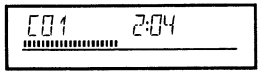
You can open and close the disc tray using the remote control.
Press and hold the **STOP ■** *button on the remote control until the dialog box shows 'OPENING' or 'CLOSING'.*

Playing a DVD video disc

A menu may appear when a DVD is played back. If the titles and chapters are numbered, press a number button on the remote control.

- ○ You can also use the ◀ , ▶ , ▲ , ▼ buttons or number buttons **0..9** to select a menu item and confirm with **OK** .
- ○ You can also access the menu using **DISC MENU** on the remote control.

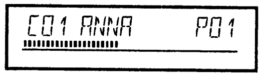
1. If playback does not start automatically, press **PLAY ▶** .
   → title/chapter number, elapsed time will appear on the display.



2. To stop playback, press **STOP ■** on the remote control or ■ on the DVD recorder.
3. To remove the disc, press **OPEN/CLOSE ▲** on the front of the DVD recorder.

Playing a DVD+RW/+R disc

❶ If the disc is write-protected or a finalised DVD+R disc, playback starts automatically.



❷ If playback does not start automatically, use the ▼ or ▲ button to select the title you want to play on the index screen.
You can also use the or button on the front.

With ⏮ , ⏭ you can jump to the begin or the end of the index screen.

❸ Press the **PLAY ▶** button.
→ title/chapter number, elapsed time will appear on the display.

× ***I can see the message 'EMPTYDISC'***
✓ *The disc does not contain any recordings.*

❹ To stop playback, press **STOP ■** on the remote control or ■ on the DVD recorder.

❺ To remove the disc, press **OPEN/CLOSE ⏏** on the front of the DVD recorder.

Playing an audio CD

You can also use the DVD recorder to play audio CDs

If the TV is on, the audio CD screen appears automatically.
During playback, the current track number and its elapsed playing time will show on the TV screen and on the recorder display.

❶ Insert an audio CD.
→ Playback starts automatically.

❷ Stop playback using **STOP ■** .
→ The number of tracks and the total time are displayed.

Playing an MP3 CD

MP3 (MPEG1 Audio Layer-3) files are highly compressed music files. Using this technology the data volume can be compressed by a factor of 10. This means it is possible to record 10 hours of music in CD quality on a single CD-ROM.

When creating MP3 CDs please note the following:
File system: ISO9660
Directory structure: maximum of 8 levels
Formats: *.mp3
Filenames: maximum of 12 characters (8+3)
Maximum of 32 albums, 999 titles
Supported sampling frequencies: 32, 44.1, 48 (kHz). Music with sampling frequencies other than these will be skipped.
Supported bit rates: 32, 64, 96, 128, 192, 256 (kbit/s)
ID3 Tag: Version 1, 1.1. In later versions the directory name is displayed as the album and the filename as the title.

Important notes for playback:
Only the first session of a multi-session CD will play back.

❶ Insert an MP3 CD.
→ Playback starts automatically.

MP3 CD display
If the TV is on, the MP3 CD screen appears automatically.

During playback, the current track number and its elapsed playing time will be shown on the TV screen and on the recorder display.
*During stopped playback (**STOP ■** button) the numbers of the albums will be shown on the TV screen and on the display.*

Further information on the album, track and artist will also be displayed if included in the ID tag.

❷ Stop playback using **STOP ■** .
→ The number of albums is displayed in the display.

○ Using ⏮ or ⏭ select the next or previous title.

○ You can also use the **T/C** button to select titles and albums.
- Press the **T/C** button and use the ▶ or ◀ button to select the 'T' symbol for title or 'C' for chapter. Use the ▼ or ▲ buttons or the number buttons **0..9** on the remote control to select the number of the title/chapter.

○ You can also use the repeat functions (**PLAY MODE** button).

Playing a (Super) Video CD

(Super) Video CDs may be equipped with PBC (Play Back Control). This means that special playback functions (menus) can be directly selected. The video CD must be PBC compatible (see CD case). 'PBC' is active in the default settings.

❶ Insert a (Super) Video CD.

→ If the '■' symbol appears in the display, start playback by pressing **PLAY ▶** .

○ If a menu appears on the screen, use the remote control buttons indicated on the screen to select the menu option you want (PREV= ⏮ , NEXT= ⏭) or with the number buttons **0..9** .

○ If a PBC menu consists of a list of titles, you can select a title directly.

○ Use **RETURN** to go back to the previous menu

❷ Stop playback using **STOP ■** .

Additonal playback features

General

DVD's are divided in titles and chapters.

○ During playback, press ▶▶I to go to the next title. If there are several chapters within a title, the next chapter.

○ Press I◀◀ to return to the start of the current title/chapter.

○ Press I◀◀ twice to return to the start of the previous title/chapter.

__Use the T/C (title/chapter) button__
- Press **T/C** *(title/chapter) and then use ▲ or ▼ to select the appropriate title.*
Make sure the symbol 'T' (title) is selected in the menu bar.
- Use **T/C** *to select chapters within a title. Press* **T/C** *and use ▶ to select the 'C' symbol (chapter).*
Now select the appropriate chapter with ▲ or ▼.

Searching a disc

You can search the disc for a recording at 4x, 8x or 32x playback speed. Other speeds can only be selected via the menu bar ('▶▶').

① During playback, press and hold I◀◀ (reverse) or ▶▶I (forwards) to switch to the search feature.

○ You can switch between the playback speeds using I◀◀ / ▶▶I .

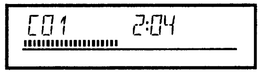
② To continue playback, press **PLAY ▶** at your chosen location.

× __No sound__
✓ The sound is switched off in search mode. This is not a fault in your machine.

__Search feature via menu bar__
- During playback press **SYSTEM MENU** *on the remote control. The menu bar will appear at the top of the screen.*
- Select the '▶▶' symbol using ▶ or ◀ and confirm with ▼ .
- You can now use the ◀ or ▶ button to select different forward and backward search speeds.
- If necessary, switch the menu bar off with the **SYSTEM MENU** *button.*
- To continue playback, press **PLAY ▶** *.*

Still picture

① During playback, press **PAUSE II** to stop playback and display a still picture.



__Frame advance via menu bar__
- During a still picture press **SYSTEM MENU** *on the remote control. The menu bar will appear at the top of the screen.*
- Select the '◁▷' symbol using ▶ or ◀ and confirm with ▼ .
- You can now use the ◀ or ▶ button to go forwards or backwards one frame at a time.
- If necessary, switch the menu bar off with the **SYSTEM MENU** *button.*

② To continue playback, press **PLAY ▶** .

Slow motion

① During playback press **PAUSE II** on the remote control. Now hold down I◀◀ or ▶▶I to switch to slow motion.

○ You can switch between different speeds using I◀◀ or ▶▶I .

__Slow motion via menu bar__
- During playback press **PAUSE II** *and then* **SYSTEM MENU** *on the remote control. The menu bar will appear at the top of the screen.*
- Select the '▷' symbol using ▶ or ◀ and confirm with ▼ .
- You can now use the ◀ or ▶ button to select different forward and backward slow motion speeds.
- If necessary, switch the menu bar off with the **SYSTEM MENU** *button.*

② To continue playback, press **PLAY ▶** twice.

Search by time

Using this feature you can select where playback should start (select elapsed time).

① During playback press **SYSTEM MENU** on the remote control.
→ The menu bar will appear at the top of the screen.

② Select the '⏱' symbol using ▶ or ◀ and confirm with ▼ .
→ Playback is stopped and a box appears on the screen showing the elapsed time.

③ Enter the start time with the digit keys **0..9** from where playback should start.

④ Confirm with **OK** .

× __The time entered will flash on the screen__
✓ The selected title is shorter than the time entered. Enter a new time or cancel the function by pressing **SYSTEM MENU** *.*

⑤ Playback starts at the time you entered.

Additonal playback features

Repeat/Shuffle play

You can mark entire sections or the whole disc for endless playback. Depending on the type of disc (DVD video, DVD+RW, video CD) you can select a chapter, title or the entire disc.

① Select the desired chapter, title or the entire disc and start playback.

② During playback, press **PLAY MODE** . By pressing **PLAY MODE** again you can chose from the following options:
•) 'chapter': repeat chapter (DVD only)
•) 'title': repeat track/title
•) 'repeat': repeat entire disc (Video CD, Audio CD only)
•) 'shuffle': Shuffle
•) Display disappears: no repeat

③ To end the repeat, press the **STOP ■** button.

○ You can also keep pressing the **PLAY MODE** button until the displays disappear.

Repeating a passage (A-B)

You can repeat a particular passage within a title/chapter. You need to indicate the start and end of the passage.

① During playback press **PAUSE II** at the start point.
→ You will see a still picture.

② Keep pressing **PLAY MODE** until 'A' appears on the screen.
→ The start point is now saved.

③
Press **PLAY ▶** to start playback.

④ When the end point is reached press **OK** .
→ 'A-B' appears on the TV screen.
Playback now takes place within these points.

⑤ To end the repeat, press the **STOP ■** button.

○ You can also keep pressing the **PLAY MODE** button until the displays disappear.

Scan feature

This feature plays back the first 10 seconds of each chapter (DVD) or track (CD).

① During playback, press **PLAY MODE** . Select 'scan' using **PLAY MODE** .
→ After 10 seconds the DVD recorder switches to the next chapter/index.

○ To start playback at the relevant chapter/index press **STOP ■** and then **PLAY ▶** .

Camera angle

If a DVD contains scenes that have been shot from different camera angles you can select these camera angles for playback.

① During playback, press **PAUSE II** .
→ You will see a still picture.

② Press **SYSTEM MENU** and select the '🎥' icon using ▶ .

× __The '🎥' symbol will be hidden__
✓ The selected scene has been shot from only one camera angle. This feature is therefore not available. For more information please read the cover of your DVD disc.

③ Select the required camera angle with ▼ or ▲ .

○ You can also directly enter the number with the number buttons **0..9** .

→ After a short time, playback will resume from the new camera angle.
The '🎥' symbol will remain visible until a scene starts for which there is only one camera angle.

Zoom feature

The Zoom feature allows you to enlarge the video image and pan through the enlarged image.

① During playback, press **ZOOM** .
→ The DVD recorder switches to 'PAUSE'. You will see a still picture.

② Select the required zoom factor using ▼ or ▲ .
→ When '***press OK to pan***' appears on the screen, the zoom process is complete.

③ Press **OK** . Using ▲ , ▼ , ▶ , ◀ select the part of the image you wish to view.

④ Confirm with **OK** .

⑤ To stop the feature, press **PLAY ▶** and then **SYSTEM MENU** .

Additonal playback features

Select the audio language

Many pre-recorded DVD discs have more than one audio language. The language initially selected for playback will be the one you selected when you first set up the DVD recorder. However you can change the audio language of the inserted disc at any time.
You can change the audio language either using the menu of the inserted disc (**DISC MENU** button) or the **AUDIO** button. The audio languages for DVD playback in the two menus may be different. Please note that with some DVDs the audio language and/or subtitle language can be changed only via the DVD menu.

❶ During playback press **AUDIO** .

❷ Select the required audio language using ▼ or ▲ .

- O You can also enter the number directly using the number buttons **0..9** .

➔ Play continues in the new audio language.

Subtitles

Many pre-recorded DVD discs have more than one subtitle language. The language initially selected for playback will be the one you selected when you first set up the DVD recorder. However you can change the subtitle language of the inserted disc at any time.
You can change the subtitle language either using the menu of the inserted disc (**DISC MENU** button) or the **SUBTITLE** button. The subtitle languages in the menus may differ.

❶ During playback press **SUBTITLE** .
Select the required subtitle language using ▼ or ▲ .

- O You can also enter the number directly using the number buttons **0..9** .
- O You can switch off subtitles again with **0** or by pressing '*off*'.

➔ Playback continues in the new subtitle language.

Disc Manager (DM)

General information

The 'Disc Manager' is an integrated database in the DVD recorder that remembers all recordings on DVD+RW/+R discs made by this DVD recorder. This gives you a complete overview of your entire video collection at the touch of a button. The Disc Manager gives you quick and easy access to every recording **made on with this DVD recorder**. The Disc Manager also tells you which film was recorded on which disc and how many unrecorded minutes remain on the discs.
And: You can go automatically to the beginning of the selected recording and start playback.

How many discs can I save in the Disc Manager?
You can store up to 999 discs on this DVD recorder. The maximum number of titles is more than 9,000. The maximum number of titles per disc is 49.

Caution when recording with other DVD recorders
Don't use a disc stored in the Disc Manager for recording on other DVD recorders. If you use a disc to record on another DVD recorder, then this disc will no longer be recognised by the Disc Manager. In this case, delete the disc from the Disc Manager's memory and then add it after it has been recorded.

Adding 'child-proof discs'
If you want to add child-proof discs you need to enter the PIN code.

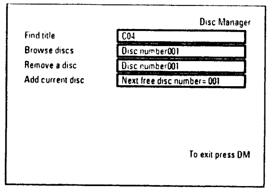
Adding a disc to the Disc Manager

You can only add DVD+RW or DVD+R discs to the Disc Manager since other discs do not hold any information on the titles or lengths of the recordings. These discs have to be at least once recorded in the DVD-Recorder. A table of content have to be available.
DVD+R discs can also be finalised. Other discs cannot be added to the Disc Manager.

Recordings are saved automatically
On a disc that has been added to the Disc Manager, you can make new recordings as often as you like using this DVD recorder. The titles of these recordings will be stored in the Disc Manager automatically.

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Insert the DVD+RW/+R disc that you want to add in the DVD recorder.


Disc Manager
Find title C04
Browse discs Disc number001
Remove a disc Disc number001
Add current disc Next free disc number= 001
To exit press DM

- ✘ ***When I insert a disc I see a number on the screen in the index picture screen in the top left-hand corner***
- ✓ *You have inserted a disc that has already been registered by the Disc Manager.*

❷ Press the **DISC MANAGER** button on the remote control.

❸ Select '***Add current disc***' using ▲ or ▼ and confirm with ▶ .

❹ Confirm with **OK** .
➔ The disc number will be added to the Disc Manager.
➔ The disc number is then displayed and the disc tray opens automatically.
The disc is now stored in the Disc Manager under the displayed disc number.
Please write this number on the disc and on the cover.

Why do I need to label the discs?
When searching for unrecorded free space or available recordings, you will asked to insert the appropriate discs (disc numbers).

❺ To end, press **DISC MANAGER** .

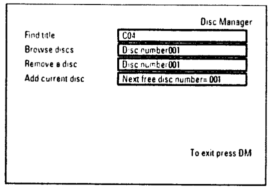
The DVD recorder will immediately recognise that this disc is saved in the Disc Manager. When this disc is inserted the disc number will appear in the title overview in the top left-hand corner.

Removing discs from the Disc Manager

Every DVD+RW/+R is stored with a number in the Disc Manager (DM). You can remove this disc number from the Disc Manager to use the Disc Manager's memory for new discs or to remove damaged discs from memory.

❶ Press **DISC MANAGER** on the remote control.

❷ Select '***Remove a disc***' using ▲ or ▼ and confirm with ▶ .


Disc Manager
Find title C04
Browse discs Disc number001
Remove a disc Disc number001
Add current disc Next free disc number= 001
To exit press DM

❸ Select the disc number with ▲ or ▼ and confirm with **OK** .

Disc contents are not deleted.
The disc is only removed from the Disc Manager's memory. Its contents remain unchanged.

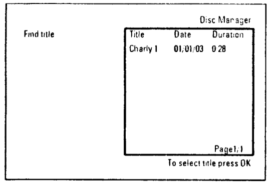
❹ To end, press **DISC MANAGER** .

Searching for a title in the Disc Manager

This function can be used to quickly and easily find and play back a recording saved in the Disc Manager.

❶ Press **DISC MANAGER** on the remote control.

❷ Select '***Find title***' using ▼ or ▲ and confirm with ▶ .
→ A list of the titles of all recordings stored in the Disc Manager (DM) will appear on the TV screen.


Find title
Disc Manager
Title Date Duration
Charly 1 01:01:03 0:28
Page1/1
To select title press OK

What do the displays on the screen mean?
'***Title***' = *Title*
'***Date***' = *Date of the recording*
'***Duration***' = *Length of the recording*

❸ Select the title that you want to play back with ▼ or ▲ .

❹ Confirm with **OK** .
→ The DVD recorder will jump to the start of the selected recording.

× ***I see the message 'Insert disc number' on my screen***
✓ *The selected recording is located on the Disc Manager disc with the displayed disc number. Please insert the appropriate disc. After a brief check, the DVD recorder will jump to the start of the selected recording.*

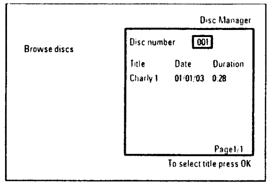
Searching discs

You can easily search for the title of a recording stored in the Disc Manager. To do this, the appropriate disc does not have to be in the DVD recorder.

❶ Press **DISC MANAGER** on the remote control.

❷ Select '***Browse discs***' using ▼ or ▲ .

❸ Confirm with ▶ .
→ The screen will show the contents of the last Disc Manager disc used.


Browse discs
Disc Manager
Disc number 001
Title Date Duration
Charly 1 01:01:03 0:28
Page1/1
To select title press OK

❹ Use ▲ or ▼ to select a different disc number if necessary and confirm with ▶ .

What do the displays on the screen mean?
'***Title***' = *Title*
'***Date***' = *Date of the recording*
'***Duration***' = *Length of the recording*

❺ Press ▲ or ▼ to select the desired title.

❻ Confirm with **OK** .
→ The DVD recorder searches for the start of the appropriate recording.

× ***I see the message 'Insert disc number' on my screen***
✓ *The selected recording is located on the Disc Manager disc with the displayed disc number. Please insert the appropriate disc.*

Searching for a blank section

You can search for space for a new recording on the disc (at least 1 minute of blank space), for example at the end of existing recordings. This only works with discs which have already been stored in the Disc Manager.

❶ Press **DISC MANAGER** on the remote control.

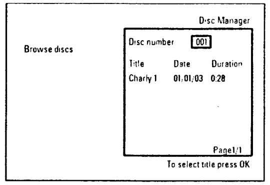
❷ Select '***Browse discs***' using ▲ or ▼ .

❸ Confirm with **OK** .
→ A list of the recordings on the disc you have selected will appear on the TV screen.

❹ Use ▲ or ▼ to select a disc (disc number) on which there is enough space for the recording.

How can I see how much space is available for the recording?
*The space available is designated as '**Empty**'. The time is displayed next to the title '**Empty**'. You can use the **REC MODE** button to change the recording mode (recording time).*

How can I choose the title 'Empty' if there were many recordings on the disc?
*In this case press ▶ and then select with ▼ , ▲ the title '**Empty**'.*


Browse discs
Disc Manager
Disc number 001
Title Date Duration
Charly 1 01:01:03 0:28
Page1/1
To select title press OK

❺ Select the title '***Empty***' with ▲ or ▼ .

❻ Confirm with **OK** .

× ***I see the message 'Insert disc number' on the screen.***
✓ *The blank space is located on the Disc Manager disc with the displayed disc number. Please insert the appropriate disc.*

→ The DVD recorder rewinds to the beginning of that particular part and automatically switches to Stop.

ENGLISH

The 'Digital Photo Manager'

General

Using the 'Digital Photo Manager', you can view and modify JPEG pictures from a memory card, Picture CD, DVD, or a CD ROM. You can store them on a DVD+RW/+R or on the memory card.
In addition, you can store the pictures in a so-called album in a specific order, yet without changing the order in which the pictures are stored on the memory card.
Moreover, you can view the pictures in a slide show at adjustable intervals.
Store the slide show on a DVD+RW/+R so you can view them on a DVD player.

How many pictures can be organized from the DVD-Recorder?
Since the storage size of a JPEG picture depends on different parameters (quality, picture information, JPEG compression, resolution of the camera,...) the limitation is only the available storage capacity.
You can store up to a maximum of 999 photos in one album on a DVD+RW/+R or memory card.
In case you want to store pictures on a medium that cannot be recorded by the DVD recorder (Picture CD, CD-ROM, finalised DVD+R, DVD), you can store up to a maximum of 100 pictures per album in 20 albums. These albums will be stored in the internal memory with the appropriate disc ID-number. With this number the allocation to the different disc is possible.

Select from the following chapters:

'The PC (PCMCIA) card',
to install or remove the memory card.

'Showing JPEG pictures from a roll' ,
in order to view and modify the pictures and create slide shows from the roll.

'Advanced editing of JPEG-pictures,
for advanced editing options such as color, sharpness...

'Creating an album ',
to arrange pictures from different rolls in a definite order and to create a slideshow from the album.

'Making a 'DVD compatible' slide show',
Make a slide show from the roll/album for viewing on a DVD-player.

'Storing rolls/albums on a DVD+RW/+R' ,
Store your JPEG pictures for archiving on a DVD+RW/+R.

'Changing roll settings' ,
to modify the rolls to your personal preferences.

'Changing album settings' ,
to modify the albums to your personal preferences.

'Changing the media settings',
to modify the storage media (DVD+RW/+R, memory cards) to your personal preferences.

What is the difference between a 'Roll' and 'Albums'?
'Roll'
A folder containing JPEG pictures. It is comparable with a conventional 35mm film for cameras. Rolls will be created automatically from the digital cameras.
'Albums'
A binary file containing references to the pictures on the rolls. It is comparable with a conventional photo album that may contain the pictures of different films (rolls).
You can delete an album without deleting the pictures of the rolls.

The PC (PCMCIA) Card

In this DVD-Recorder you can use the following types of memory cards with an adapter:
•) SD memory cards
•) Multimedia Card
•) CompactFlash
•) SmartMedia
•) Memory Stick/Memory Stick pro
•) Micro Drive
•) xD Picture Card

The DVD-Recorder can read/write files, which were stored on memory cards using the file systems FAT 8, FAT 12, FAT16 and FAT 32. This means that it can handle memory cards larger than 2 GB.

Inserting the PC Card

❶ If necessary, insert the memory card into the PC Card adapter first.
The label must be facing up.
The contacts must be facing the device.

❷ Insert the PC Card into the media slot in the front of the recorder until the EJECT button sticks out of the device front completely.
Press this button only if you want to remove the PC Card.

Removing the PC Card

❶ Press the EJECT button next to the PC Card.

❷ This will push the card out of its slot.
If the card remains in the slot, insert the PC Card once again and press the EJECT button again.

Warning !
Insert/Remove the PC Card only when there is no access to the memory card. This could damage the memory card.

You can recognise the access by:
•) A moving disc symbol lights up on the top left corner of the screen

If you were not sure, press in the 'Digital Photo Manager' the button **PHOTO** . This will take you directly into the '***Media menu***' screen.
You can also switch the DVD-Recorder off with the **STANDBY** ⏻ button.

The 'Digital Photo Manager'

Showing JPEG pictures from a roll

The DVD recorder can read JPEG pictures stored on a CD-ROM, Picture CD, memory card, or a DVD and write them on a DVD+RW/+R or memory card.

Please observe the following:
- The file extension has to be '*.JPG' and not '*.JPEG'.
- These pictures must be stored in the root directories or in a subfolder called 'DCIM' in folders. These will be recognized by the DVD recorder as rolls (comparable with a 35mm roll for cameras). You can select the directories (folders) as rolls in the '***Media menu***'.
- This device is compatible with still pictures (JPEG)
- It can only display DCF-standard still pictures or JPEG pictures e.g. TIFF. It cannot play back moving pictures, Motion JPEG, and other formats, or pictures in formats other than JPEG, or pictures associated with sound e.g. AVI-files.

❶ Insert the medium you want to use (CD, DVD+RW/+R, memory card).

❷ Press **PHOTO** on the remote control.
→ The '***Media menu***' will appear.

❸ Use ▼ or ▲ to select the medium you want to process (disc or memory card).
→ If you did not insert the corresponding medium (disc or memory card), a warning sign will appear above the symbol on the left hand side of the screen.

❹ Confirm with ▶ .

❺ Select '***Roll***' using ▼ or ▲ and confirm with ▶ .

→ You will see an overview with the first picture of each roll that contains pictures. The display and the description of the roll will depend on the camera or the computer program used to create this roll.

❻ Select the desired roll using ▼ or ▲ and confirm with **OK** .
→ The data will be read and then an overview of the stored pictures will be displayed.

O You can select a picture for viewing or editing with ◀ , ▶ , ▼ , ▲ .

Fast browsing trough the pictures
With ▶▶| *or* |◀◀ *you can switch one page forward or backward.*
You can also select a picture with the number buttons **0..9** *on the remote.*

❼ Press **OK** to select the desired picture.

→ The picture will be displayed as a full picture on the screen.

Editing JPEG pictures

❶ On the corresponding pictures press **SELECT** to select them for editing.
→ The picture frame appears in a different color.
If you want to deselect the pictures, press **SELECT** on the selected pictures again.

❷ Keep pressing ▲ until the menu bar is selected. Select one of the displayed functions with the ▶ or ◀ button.
- O '***Menu***' Leave the menu
- O '***Play***' Starts the slide show
- O '***Erase***' Erases the selected pictures
- O '***Rotate***' Rotates the selected pictures by 90
- O '***Copy***' Copies the selected pictures on the other loaded media (from memory card to DVD+RW/+R or vice versa)
- O '***Select all***' Selects all pictures
- O '***Cancel***' Cancels the changes

Using the buttons on the remote
- '***Play***' *Button* **PLAY ▶**
- '***Erase***' *Button* **CLEAR** *and then* **OK**
- '***Rotate***' *Button* **ANGLE**

Slide show

You can display JPEG pictures in the selected roll automatically one after the other at adjustable intervals.

O **Starting the slide show**
Press **PLAY ▶** to start the slide show.

O **Interrupting the slide show**

- Press **PAUSE II** . This will stop the automatic display of the pictures.
- Press **PLAY ▶** to resume the slide show.

O **End the slide show**
Press **STOP ■** . The picture overview will appear.

The 'Digital Photo Manager'

Changing the slide show settings

① Press **SYSTEM MENU** during playback of the slide show.

② Select one of the displayed functions with the ◀ or ▶ button.

- O *'Overview'*
  Returns to the picture overview. Has the same function as **STOP ■**
- O *'Play'*
  Resumes the slide show. Has the same function as **PLAY ▶**
- O *'Timer'*
  Select one of various speeds by pressing ▼
  Confirm with ▶ .
  Start the slide show with **PLAY ▶** .
- O *'Repeat'*:
  Switches repeat playback of the slide show on and off

Using the buttons on the remote
-Repeat playbackButton **PLAY MODE**
-Enlarge picturesButton **ZOOM**
-Edit picturesButton **EDIT**

Advanced editing of the JPEG pictures

You can edit the pictures in the DVD recorder and then store them back on the memory card or a DVD+RW/+R. The original picture remains unchanged, and the modified one is additionally stored on the medium.
Please make sure the memory card or DVD+RW/+R is not write-protected and has enough storage space.

① Press at the required picture the button **EDIT** .

② Select one of the displayed functions with the ◀ or ▶ button.

Using the buttons on the remote
- **ANGLE** : *Rotates the picture*
- **ZOOM** : *Enlarge the picture*
- **STOP ■** : *Returns to the picture overview*
- **CLEAR** : *Discard the changes. The picture will be reloaded.*

'Overview'

Returns to the picture overview.

'Rotate'

Rotates the picture by 90 each time you press **OK** .

'Flip'

Mirrors the picture along its vertical axis when you press **OK** .

'Zoom'

Using this function, you can enlarge the picture and pan through the enlarged picture.

① Press **OK** to activate the zoom function.

② Select the area to be enlarged with ◀ , ▶ , ▼ , ▲ .

③ You can press **ZOOM** to enlarge the selected area at several steps.

④ Press **OK** to return to the normal picture size.

'Filters'

Using this function, you can modify the picture properties.

① Press ▼ and select one of the displayed functions using ▼ or ▲ . Confirm with ▶ .

- O *'Sep***Displays the entire picture in brown colors. It gives the picture an 'antique' appearance.**
- O *'Negative'*:
  Converts the picture into a black-and-white negative.
- O *'Colour negative'*:
  Converts the picture into a color negative. Comparable to a color negative film.
- O *'Black & white'*:
  Converts the picture into a black-and-white picture.
- O *'Soften'*:
  Use this function to reduce picture sharpness in three steps, from edge blurring to a visible blur.

② To end, keep pressing ▲ until the menu bar is selected.

'Colour'

Using this function, you can change the red, green, and blue color components of the picture.

① Press ▼ .

② Use ▼ or ▲ to select the corresponding color control.

③ Change the color using ◀ or ▶ .

④ To end, keep pressing ▲ until the menu bar is selected.

'Reset'

This setting will appear only if changes have already been made to the picture. If you want to discard the changes, confirm with **OK** .

'Save'

This setting will appear only if changes have already been made to the picture. If you want to save the changes, confirm with **OK** .

The 'Digital Photo Manager'

Creating an album

You can store pictures contained in a memory card or DVD+RW/+R in a so-called '***Albums***' in a different order. Albums are binary files containing information on the orientation and storage location of the pictures.
Albums from a medium that cannot be recorded by the DVD recorder (Picture CD, CD-ROM, finalised DVD+R), will be stored in the internal memory of the DVD recorder. You can store up to a maximum of 100 pictures per album in 20 albums.

Adding pictures to an album

① Select '***Albums***' in the '***Media menu***' using ▼ or ▲ and confirm with ▶ .

② An overview of the albums you already created will appear. Select '***New album***' with ▼ to create a new album.

③ Press ▶ . The menu '***Album Settings***' will appear.
In a new album, the line '***Add photos***' is already highlighted.

④ Confirm with **OK** .

⑤ The roll overview will appear.

⑥ Use ▼ or ▲ to select the roll from which you want to add pictures to the album.

⑦ Confirm with ▶ .
The picture overview will appear.

⑧ Use ◀ , ▶ , ▼ , ▲ to select the pictures you want to add to the album.

⑨ Confirm each selected picture with **SELECT** . Do not pay attention to the order of the pictures. You can change it later in the album.

Select all pictures
If you want to store many pictures in the album, select '***Select all***'.
Then use **SELECT** *to select the pictures you don't want to add to the album.*
These pictures will be deselected.

⑩ Keep pressing ▲ until the menu bar is highlighted.

⑪ Select '***Done***' with ◀ or ▶ to add all selected pictures to the album.

⑫ Confirm with **OK** .
The album will be created. 'SAVING' will appear in the display while the album is created.
Do not remove the medium from the device!

⑬ The menu '***Album Settings***' will then automatically appear.

⑭ To add additional pictures, use ▼ to select '***Add photos***' and confirm with **OK** .

⑮ Repeat steps ⑤ to ⑭ until the album contains all the desired pictures.

Changing the picture order within an album

You can change the order of the pictures within an album as you wish.
The order of the pictures of the rolls remains unchanged.

① Select '***Albums***' in the '***Media menu***' using ▼ or ▲ and confirm with ▶ .
An overview of the albums you already created will appear.

② Press ▶ to select the desired album. The '***Album Settings***' menu will appear.

③ Select '***Overview***' by pressing ▼ . The '***Overview***' option can be found on the second menu page

④ Confirm with **OK** .

⑤ Use ▼ , ▲ , ◀ , ▶ to select the picture you want to move to a different position.

⑥ Press **SELECT** . The picture frame appears in a different color.

⑦ Keep pressing ▲ until the menu bar is highlighted.

⑧ Select '***Move***' using ◀ or ▶ and confirm with **OK** .

⑨ Use ▼ , ▲ , ◀ , ▶ to select the position **before** which the desired picture is to be moved.

⑩ Confirm with **OK** . The picture will be inserted.

The 'Digital Photo Manager'

Editing pictures in an album

You can also erase, rotate, or hide pictures in an album. These changes will only affect the album. The pictures on the disc or the memory card will remain unchanged.

① Select the pictures you want to change in the '*Album overview*' using **SELECT**.

② Keep pressing ▲ until the menu bar is highlighted.

③ Select one of the displayed functions with the ◀ or ▶ button.

- ○ '*Menu*': **Closes the current menu**
- ○ '*Play*':
  Starts the slide show of the album
- ○ '*Move*':
  Changes the order of pictures within an album.
- ○ '*Erase*':
  Erases the pictures from an album. The picture on the media remains unchanged.
- ○ '*Rotate*:
  Rotates pictures by 90
- ○ '*Hide*':
  Hides pictures for the slide show
- ○ '*Select all*':
  Selects all pictures
- ○ '*Cancel*':
  Discards all changes

Using of the buttons on the remote
- '*Play*':
Button **PLAY MODE**
- '*Erase*':
Button **CLEAR**
- '*Rotate*':
Button **ANGLE**

Making a 'DVD compatible' slide show

Using this function, you can record the pictures in such a way, that you can view the slide show from a roll or an album on a DVD player.
The slide show will be stored on the DVD+RW/+R as a video title. If you want to store the photos in the JPEG format in addition to the video title, you must prepare the DVD+RW so that you can store both pictures and videos. See section 'Preparing a DVD+RW/+R'.
On a DVD+R you can only store either photos or videos. A combination of JPEG photos and video is not possible.

Making a slide show from an album

① Select the disc (top symbol) in the '*Media menu*' and confirm with ▶.

② Add pictures to the album as described in chapter 'Adding pictures to the album'.

③ You can change the order of the pictures, erase unwanted pictures, enter a new name for an album, or change the cover picture of the album, until the album corresponds to your personal preferences.

④ Select '*Make video title*' in the menu '*Album Settings*' using ▼, ▲.

⑤ Confirm with **OK**.
→ 'SAVING' will appear in the display and the screen will show the time left until completion.
The new album will be stored on the DVD+RW/+R as a video title (movie). It will appear in the index picture screen as a separate title.

This video title will be recorded automatically after the last recording. No existing titles will be overwritten.
Ensure that there is enough space on the disc.

⑥ To end, press **DISC MENU**.

The 'Digital Photo Manager'

Making a slide show from a roll

Each roll will be stored as one video title on the DVD+RW/+R.
If you want to make a video title from different rolls, you have to create an album first. Then you can store the album as a video title on the DVD+RW/+R.

① In the '*Media menu*' screen select the memory card (symbol in the middle) and confirm with ▶.

② Select the line '*Rolls*' and confirm with ▶.

③ Select with ▼, ▲, the roll from which you want to make a video title.

④ Press ▶ the '*Roll Settings*' menu will appear.

⑤ Select the line '*Make video title*' using ▼, ▲ an confirm with **OK**.
→ 'SAVING' will appear in the display and the screen will show the time left until completion.

→ The new roll will be stored on the DVD+RW/+R as a video title (movie). It will appear in the index picture screen as a separate title.

This video title will be recorded automatically after the last recording. No existing titles will be overwritten.
Ensure that there is enough space on the disc.

⑥ To end, press **DISC MENU**.

Storing rolls/albums on a DVD+RW/+R

If you want to store the JPEG pictures from the rolls/albums on a DVD+RW/+R, you must first prepare the disc.

Preparing a DVD+RW/+R

① Press **PHOTO** on the remote control. The media menu will appear.

② Use ▼ or ▲ to select the disc alone as a medium. If you did not insert a disc, a warning sign will appear above the symbol on the left hand side of the screen.

③ Press ▶.

④ Select '*Media settings*' using ▼ and confirm with **OK**.

⑤ Use ▼ or ▲ to select whether you want to store '*Photo only*'or '*Video & photo*' together on this disc.
Please note, that DVD+R's or memory cards can only be prepared for '*Photo only*'.

What is the difference?
'Photo only'
The DVD+RW/+R will be prepared so that only pictures can be stored on the entire disc (4,4 GB).
'Video & photo'
On the DVD+RW/+R a space (650 MB) will be reserved for storing pictures additionally to movies. So you can store the appropriate photos after the movie.
A DVD+R can not be prepared for 'Video & photo'
How long does this process last?
To prepare a disc for 'Video & photo', a new DVD+RW has to be formattet first. This can take up to 25 minutes. You can speed up the process, if you use a prerecorded disc.

⑥ Confirm with **OK**.

WARNING!
All data on the disc will be erased.
- ○ If you want to continue, press **OK**.
- ○ To cancel the process, press ▼ or ▲.

→ 'PREPARING' will appear in the display until the preparation is complete.

→ If the disc has been successfully prepared, the '*Media settings*' menu will appear, indicating the available storage space. (4.4 GB for '*Photo only*'/650MB for '*Video & photo*')

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Manual recording

General

With this DVD recorder, you can record on two types of DVD:

DVD+RW (Digital Versatile Disc + wiederbeschreibbar)
This disc can be written to and then the contents deleted.

DVD+R (Digital Versatile Disc + einmalbeschreibbar)
This type of disc can only be recorded once.

If you want to play this DVD in a DVD player it must be finalised using the '***Finalise disc***' function. It is not possible to make further recordings using this disc.

If this disc is to be played in a DVD recorder it must not be finalised. Recordings can be added and deleted. The disc space (playback time) from the deleted recording cannot be recovered for further recordings

- To add a new recording at the end of the last recording on the disc, hold down the **REC/OTR ●** button until the message 'SAFE REC' appears on the display.
- For DVD+R discs each new recording is always added at the end of all previous recordings as existing recordings cannot be overwritten.
- If the end of a disc is reached during recording, recording will stop and the Recorder will turn itself off automatically.

Recording without automatic switch-off

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Insert a disc on which the recording is to be made.
→ This disc is then checked for content and system.
'READING' will appear on the display.

❷ Wählen Sie mit der Taste ▼ oder ▲ jenen Titel der überschrieben werden soll, oder '***Empty title***'.

○ Sollte eine neue DVD+RW/+R eingelegt sein, erscheint im Anzeigefeld 'EMPTYDISC'. Da noch keine Indexbild-Anzeige verfügbar ist, können Sie sofort mit der Aufnahme beginnen.

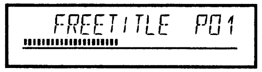
○ Sollten Sie Aufnahmen zwischen bereits vorhandenen Aufnahmen einfügen, beachten Sie die Länge der alten und der neuen Aufnahme. Sollte die neue Aufnahme zu lang sein, wird die nachfolgende Aufnahme (Titel/Kapitel) überschrieben.

× ***A dialog box appears asking you whether you want to delete the contents or eject the disc***
✓ *The disc inserted is a DVD+RW but its contents are not DVD video-compatible (e.g. a data disc). Recordings on this disc can only be made if the entire disc is first deleted with the* **REC/OTR ●** *button.*

× ***The message 'Title limit' appears on the screen if a recording is to be made***
✓ *A disc may contain a maximum of 48 titles (including blank titles). Delete titles or change the disc.*

❸ If necessary, use the **MONITOR** button on the remote control to switch to the internal tuner in the DVD recorder.

❹ Use **CHANNEL +** or **CHANNEL −** to select the programme number (station name) you want to record.
→ This will appear on the display:

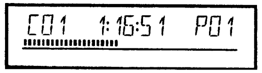


Programme numbers of the external inputs:
'EXT1'
Scart socket at the back **EXT1 TO TV-I/O**
'EXT2'
Scart socket at the back **EXT2 AUX-I/O**
'CAM1'
Front SVHS/audio sockets **S-VIDEO (CAM1) / AUDIO L/R (CAM1)**
'CAM1'
Front video/audio sockets A/V **S-VIDEO (CAM1) / AUDIO L/R (CAM1)**
Switching between the **S-VIDEO (CAM1)** *and* **VIDEO (CAM1)** *sockets takes place automatically. If a signal is available at both sockets at the same time, the signal at the* **S-VIDEO (CAM1)** *socket has priority.*
'CAM2'
Digital Video (i Link) front socket **DV IN (CAM2)**

❺ To start recording, press **REC/OTR ●** on the remote control or **RECORD** on the DVD recorder.

○ If you want to start the recording at the end of the existing recordings, hold down the **REC/OTR ●** button until the message 'SAFE REC' appears on the display.
For DVD+R discs each new recording is always added at the end of all previous recordings as existing recordings cannot be overwritten.

→ This will, for example, appear in the display:



Manual recording

Insert chapter markers
During recording you can mark scenes so you can find them or hide them later.
During recording, press **EDIT** *at the start point.* ***'Inserting marker'*** *appears on the TV screen. In the display, the number of the 'CHAPTER' increases by one.*
For further information on titles and chapters, see the section on 'Changing to another title/chapter' in 'Playback'.

❻ Use the **STOP ■** button on the remote control or **■** on the machine to stop the recording.
→ 'MENU UPDT' will appear on the display.
The DVD recorder is writing the list of contents. Wait until the message disappears from the display. The recording is then complete.

→ The display will read 'DISC ERR'
Recording could not be completed correctly because of a disc error. Check the disc and clean it if necessary.

Making recordings on DVD+R discs compatible
If you want to play back the recording on a DVD player, you need to finalise the disc in the DVD recorder. You can prepare your DVD for use in a DVD player using the ***'Finalising'*** *feature. See 'Finalising DVD+R discs' in 'Managing the disc contents'.*

Interrupt recording (Pause)

With this function you can interrupt and continue recordings without creating a new title

❶ During recording press **PAUSE II** , for example to avoid recording the commercials.

❷ To continue recording, press **REC/OTR ●** .

End recording
To end the recording, press the **STOP ■** *button. Wait until 'MENU UPDT' disappears from the display.*

Recording with automatic switch-off (OTR one-touch-recording)

With this function you can start a recording manually but end automatically within a certain time. Thus avoid recordings till the end of the disc.

❶ Insert a disc.

❷ If necessary, use the **MONITOR** button on the remote control to switch to the internal tuner in the DVD recorder.

❸ Use **CHANNEL +** or **CHANNEL −** to select the programme number (channel name) you want to record.

❹ Press **REC/OTR ●** on the remote control.
○ Each time you press **REC/OTR ●** you will add 30 minutes to the recording time..

How can I cancel the recording time I have just entered?
To delete an entry, press **CLEAR** *while the display shows the recording time.*
How can I check the remaining recording time?
Press **SYSTEM MENU** *while an OTR is in progress. The time at which the recording will end will appear on the TV screen in the timer info box.*

Preventing accidental erasing of discs

To ensure you don't accidentally delete a recording you can protect the entire disc. You can only ever protect the entire disc. You cannot protect individual recordings.

__What happens with DVD+R discs?__
As long as these discs are not finalised, they can be protected against accidental erasure in the same way as DVD+RW discs.

❶ Insert the disc to be protected.

❷ While the index screen is displayed press **STOP ■** on the remote control.
→ The first title is highlighted.

❸ Press ▲ .
→ This takes you to the disc info screen.

❹ Press the ▶ button.
Select the '***Protection***' line.
Confirm with ▶ .

❺ Select '***Protected***' with the ▼ button and confirm with **OK** .

❻ Press ◀ and then **DISC MENU** to terminate.
→ The entire disc is now protected.
If an attempt is made to record on a protected disc, 'DISC LOCK' will appear on the display and '***Disc locked***' will appear on the screen.

If you later decide to record on the disc, follow these steps but select '***Unprotected***' *at step* ❺ .

Lining up recordings within a title (assemble cut)

On a recorded DVD+RW disc you can add another recording to an existing title. This recording is added to the title as a 'chapter'. The existing information will be overwritten starting from this point. Titles will also be overwritten that follow the current title depending on the length of the new recording. The recording type (Quality) will be taken from the current title.
To play back this recording, press **SYSTEM MENU** and use the ▶ button to select the 'C' (Chapter) symbol. You can also use the **T/C** key.

For further information, see 'Changing to another title/chapter' in 'Playback'.

__What happens with DVD+R discs?__
New recordings on 'DVD+R' discs can only be added after existing recordings. It is not possible to overwrite existing recordings on 'DVD+R' discs.

❶ In the index display, find the title to which the new recording is to be added.

❷ Look at the last minute of the old recording (playback)

❸ Press **PAUSE II** on the remote control at the position where the new recording is to go.
→ 'II ' will appear on the screen.

○ To monitor the recording you can press **MONITOR** to switch to the internal tuner.

❹ Now start recording as usual by pressing **REC/OTR ●** on the remote control.
→ The new recording will be added.

❺ Stop recording with **STOP ■** .

Selecting the recording mode (picture quality)

You can select the picture quality of the recording using the recording quality feature and hence the maximum recording time per disc.
To check the quality of a recording mode you can make a 'test recording' with the desired recording mode. Check during playback the quality of this 'test recording'.
During playback, the correct picture quality will automatically be selected.

❶ Select the record mode with the button **REC MODE** on the remote control before you start the recording.
→ Please observe, that you can not switch the recording type during recording. You have to interrupt the recording with the **STOP ■** button.

○ '***M1***': High Quality offers the best picture quality and a recording time of 1 hour.

○ '***M2***': Standard Play (pre-recorded DVD quality) offers standard picture quality and a recording time of 2 hours.

○ '***M2x***': Standard Play plus (better than S-VHS quality) offers standard picture quality and a recording time of 2.5 hours.

○ '***M3***': Long Play (S-VHS picture quality).

○ '***M4***': Extended Play (better than VHS picture quality). Recording time of 4 hours.

○ '***M6***': Super Long Play (VHS picture quality). Recording time of 6 hours.

○ '***M8***': Super Extended Play (VHS-LP picture quality). Recording time of 8 hours.

You can also set a record mode as a basic setting

❶ Press the **SYSTEM MENU** button.

❷ Select 'T⅄' symbol with ◀ or ▶ .

❸ Select '***Record settings***' using ▼ or ▲ and confirm with ▶ .

❹ In the line '***Record mode***' select the recording type with ◀ or ▶ .

❺ Confirm using **OK** and **SYSTEM MENU** .

❻ If you have selected the recording mode '***M3***', '***M4***', '***M6***' or '***M8***', you can select the '***Stndrd***' (Standard) or '***Sport***' setting (for rapid movements) in the '***Filter mode***' line.

Automatic recording from a satellite receiver (Sat recording)

You can use this function if your own a satellite receiver that can control other devices via a scart cable and a programming function (timer). For more information, please see the operating instructions for the satellite receiver.

❶ Switch on the TV set. If required, select the programme number for the DVD recorder.

❷ Press **SYSTEM MENU** on the remote control.
→ The menu bar appears.

❸ Select 'T⅄' symbol with ◀ or ▶ .

❹ Select '***Record settings***' using ▼ or ▲ and confirm with ▶ .

❺ Select '***EXT2***' in line '***Sat record***' with ◀ or ▶ .

__Switching off 'Sat Recording'__
To switch off the function, select '***Off***' *using* ▶ *or* ◀ .

❻ Confirm with **OK** .

❼ Use a scart cable to connect scart socket **EXT2 AUX-I/O** on the DVD recorder to the corresponding scart socket on the satellite receiver.

❽ To end, press **SYSTEM MENU** .

❾ Insert a disc you want to use for recording.

❿ Programme the satellite receiver with the required information (programme number of the TV channel, start time, finish time).
If necessary, please see the operating instructions for your satellite receiver.

⓫ Switch off the DVD recorder using **STANDBY ⏻** .
→ 'SAT' also appears in the display to indicate that the function is active.

The DVD recorder is now ready to record.
→ The start and end of the recording is controlled via scart cable **EXT2 AUX-I/O** .

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Manual recording

Direct Record

Can you record the right TV channel in seconds when the DVD recorder is switched off? No problem. If recording is started manually, the **switched-off** DVD recorder takes the current TV channel from the TV set via the scart cable.
You will find more information on how to switch 'Direct record' on or off in the next section 'Direct record'.

How does Direct Record work?
The DVD recorder compares the TV channel selected on the TV set with its stored TV channels via the scart cable. If the same TV channel is found, it switches the DVD recorder to the corresponding programme number and starts recording.

Please do not change channel on the TV during the search. This could affect the tuning of the DVD recorder.

❶ On the TV set, select the programme number you want make the recording from.

❷ Press **REC/OTR ●** with the DVD recorder **switched off.**

→ The display will read 'WAIT'

The DVD recorder is comparing its saved TV channels with those of the TV set. Please do not change the TV channel on the TV set while 'WAIT' is shown in the display.

→ 'NOTV' appears in the display
This TV channel could not be found in the DVD recorder's memory.
Check that all TV channels saved on the TV set are available on the DVD recorder. If required, save any missing channels. Please read 'Manual TV channel search' in 'Installing your DVD recorder'.

Check the connectors at both ends of the scart cable.

Check your TV's operating instructions to see which scart socket is used for video signals.
If the problem persists, you won't be able to use this feature.

❸ Stop recording with **STOP ■** .

Switching 'Direct Record' on or off

❶ Switch on the TV set. If required, select the programme number for the DVD recorder.

❷ Press **SYSTEM MENU** on the remote control. The menu bar appears.

❸ Select 'TA' symbol with ◄ or ► .

❹ Select '***Record settings***' using ▼ or ▲ and confirm with ► .

❺ Select '***Direct Record***' using ▼ or ▲ .

❻ Select '***On***' (Direct Record on) or '***Off***' (Direct Record off) using ► .

❼ Confirm with **OK** .

❽ To end, press **SYSTEM MENU** .

Recording from a video recorder/DVD player

Please observe:
Most pre-recorded video cassettes or DVDs are copy-protected. If you try to copy these, the message 'COPY PROT' will appear in the display of the DVD recorder.

❶ Schalten Sie das Fernsehgerät. Wählen Sie falls erforderlich die Programmnummer für den DVD-Recorder.

❷ Switch on the DVD recorder.

❸ Insert a DVD+RW/+R ready for recording.

❹
❺ Locate on the DVD+RW/+R the position where you want to start the recording.

❻ If necessary press **STOP ■** to stop playback.

❼ Select recording mode picture quality) using **REC MODE** .

❽ Press **MONITOR** to display the picture of the Video recorder/DVD player on the screen.

❾ Use ▼ , ▲ to select the programme number of the input socket to which the Video recorder/DVD player is connected. ('***EXT1***' for **EXT1 TO TV-I/O** , '***EXT2***' for **EXT2 AUX-I/O**)

❿ Switch on the video recorder/DVD player.

○ In case playback has started automatically, interrupt it with **STOP ■** or **PAUSE II** .

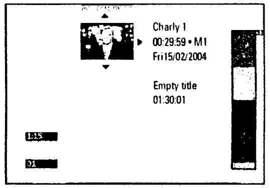
⓫ Start recording by pressing **REC/OTR ●** on the DVD recorder and playback by pressing **PLAY ►** on the video recorder/DVD player.

× ***When copying video cassettes, 'NO SIGNAL' appears in the display of the DVD recorder***
✓ *Check whether the cable connectors are properly inserted.*
✓ *If the recording is made from a video recorder, change the 'tracking' setting on the video recorder.*
✓ *In case of bad or non-standard video input signals, the DVD recorder may be unable to detect the signal.*

× ***When copying DVD video discs or pre-recorded video cassettes, the picture is fuzzy and brightness varies***
✓ *This happens when you try to copy DVDs or video cassettes that are copy-protected. Although the complete cassette/disc is recorded, only parts without copy protected signal can be played back. This interference is unavoidable with copy-protected DVDs or video cassettes.*

Managing the disc contents

General



When a recording is made to disc, the following additional information is also stored at the beginning of the recording:
•) Name of the recording
If the TV station does not transmit a name, only the channel number and time will be stored as the name
•) Length of the recording
•) Record type (Quality)
•) Date of the recording
•) Index picture of the recording

A marker will be set every 5-6 minutes if the '***Auto chapters***' function is activated in the '***Record settings***' menu. This marker is known as a 'chapter'.
These markers can be changed when the recording has finished.

Can markers be set on a DVD+R disc?
Markers can be set on these discs if they have not been finalised.

It is also possible to add 'chapters' later. This means that scenes you do not want to see during playback can be hidden or skipped. During playback you can watch your recording as a continuous sequence without the hidden chapters.

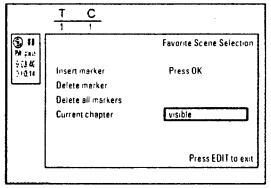
Favorite Scene Selection

In this menu you can adapt a title to suit your particular needs.
You can insert/delete chapter markers, hide chapters, select a new index, or split up a title. Press **EDIT** on the remote control during recording to open this menu.

Insert chapter markers

During recording, you can set or delete chapter markers within a title. The maximum number of chapters per disc is 255 and 99 per title. If one of these limits is reached the following message will appear on the screen: '***Chapter limit***'. You need to delete some markers before you can insert new ones or make recordings.

❶ During playback, press **EDIT** on the remote control at the appropriate point.
→ The '***Favorite Scene Selection***' menu appears on the TV screen.



❷ Confirm '***Insert marker***' by pressing **OK** .
→ '***Inserting marker***' appears on the TV screen.

'X' will appear on the screen:
This DVD is write-protected or the disc is a finalised DVD-R. Subsequent changes cannot be made.

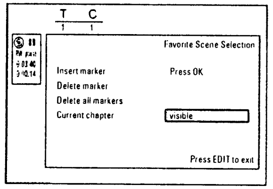
❸ To stop this function, press **EDIT** .

Managing the disc contents

Hiding chapters

Initially, all the chapters are visible. You can hide chapters for playback (e.g. unwanted scenes) or make them visible again. In editing mode, hidden chapters are shown darker.
A chapter always consists of a start marker and an end marker.
To hide a certain scene, proceed as follows:

① Search the beginning of the scene you want to hide. Press **PAUSE II** .


T C
1 1
Favorite Scene Selection
Insert marker
Delete marker
Delete all markers
Current chapter
Press OK
visible
Press EDIT to exit

② Press **EDIT** on the remote control to call the '*Favorite Scene Selection*' editing menu.

③ Set the start marker using **OK** .
→ The number of chapters ('C') in the menu line will increase by one.

④ Search for the end of the scene.
○ You can also use ▶▶I or I◀◀ to search faster for the end of the scene.
Make sure that you do not jump into the next title (title number 'T' must not change).

○ Only chapters within a title can be hidden.

⑤ Press **PAUSE II** at the corresponding position.

⑥ Set the end marker with **OK** . This will also be the start marker of the next chapter.
→ The number of chapters ('C') in the menu line increases by one.

× ***The number of chapters ('C') has increased by two or more numbers***
✓ *This is the case when you want to hide a chapter that, due to automatic chapter numbering (if switched on), stretches over two or more chapters. In this case, you must delete the start of the automatically generated chapter:*
- Press **T/C** *twice while the editing menu is displayed to change the chapter number.*
- Select the chapter between the new markers using ▼ *or* ▲ *. Press* **PAUSE II** *.*
- Select ***'Delete marker'*** *with* ▼ *to delete the current chapter marker. Confirm with* **OK** *. The current chapter number decreases by one.*

⑦ Press **T/C** twice to change the chapter number 'C'.

⑧ Select the previous chapter with ▼ , since you are already in the next chapter (end of the chapter is also the beginning of the next chapter).

⑨ Wait until the chapter has been played and press **PAUSE II** to stop playback.

⑩ Select '*Current chapter*' using ▼ or ▲ .

⑪ Using ▶ select '*hidden*'.
→ The picture is shown darker.

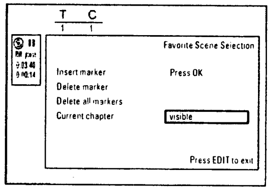
Switching quickly
*You can switch between show chapters (**'visible'**) and hide chapters (**'hidden'**) quickly and easily using* **SELECT** *.*
This function is independent from the selected line.

⑫ To end, press **EDIT** .

During playback this chapter will be skipped.
If the chapter is not visible, select '***visible***' in step ⑪ with ▶ .

Deleting chapter markers

Within a title you can delete either all markers or individual markers.


T C
1 1
Favorite Scene Selection
Insert marker
Delete marker
Delete all markers
Current chapter
Press OK
visible
Press EDIT to exit

① While the relevant chapter is playing, press **EDIT** on the remote control.
→ The '***Favorite Scene Selection***' menu appears on the TV screen.

How can I select different chapters?
- Press the **T/C** *button on the remote control. Titles and chapters are displayed at the top of the screen.*
- Select title (T) or chapter (C) with ▶ *or* ◀ *.*
- Use ▲ *or* ▼ *to select the title/chapter channel you want to edit.*

② Use ▼ to select:
○ line ***Delete marker'*** for this chapter

○ line '***Delete all markers***' for all chapters within the selected title.

Managing the disc contents

③ Confirm with **OK** .
○ You will be prompted to press **OK** again to make sure you really want to delete all markers.

○ If you do not want to, press the ◀ button.

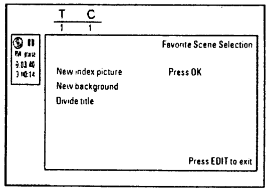
④ To end the menu , press **EDIT** .

Changing the index picture

Normally the picture from the beginning of a recording is used as the index picture. You can however choose any picture from the recording as the index picture.

① During playback, search for location of the new index picture. Press the **PAUSE II** button.

② Press the **EDIT** button.
→ The '***Favorite Scene Selection***' menu appears on the TV screen.


T C
1 1
Favorite Scene Selection
New index picture
New background
Divide title
Press OK
Press EDIT to exit

③ Select line '***New index picture***' and confirm with **OK** .

④ Start the change with **OK** .
→ '***Updating menu***' appears on the TV screen.

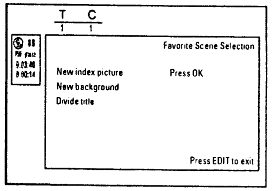
Once the revision has been completed successfully the DVD recorder reverts to the index overview.

Changing the menu background

You can choose any frame from the recording as the menu background. This setting is stored on the inserted DVD. Please note that after the modification the 'original background' will be lost.
If you erase the complete disc (close the disc tray with **CLEAR** and make a recording) the 'original background' will be restored.

① During playback, search for the location that is to be used as the new menu background. Press **PAUSE II** .

② Press **EDIT** .
→ The '***Favorite Scene Selection***' menu appears on the TV screen.


T C
1 1
Favorite Scene Selection
New index picture
New background
Divide title
Press OK
Press EDIT to exit

③ Select line '***New background***' and confirm with **OK** .

④ Start the change with **OK** .
→ '***Updating menu***' appears on the TV screen.

→ Once the revision has been completed successfully the DVD recorder reverts to the index overview.

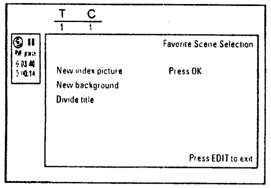
Managing the disc contents

Dividing titles

You can divide a title into several sections (titles) of any size. Each of these sections (titles) is identified by its own index.
Note: This division cannot be undone.

Can I divide titles on DVD+R discs?
As recordings on DVD+R discs cannot be overwritten, it is not possible to divide titles on DVD+R discs.

❶ While the relevant title is playing, press **EDIT** on the remote control.
→ The '***Favorite Scene Selection***' menu appears on the TV screen.



❷ Select '***Divide title***' and confirm with the **OK** button.

❸ If you are sure, press **OK** to start the process.
→ '***Dividing title***' appears on the TV screen.

❹ Wait until the new title is displayed with an index picture in the index picture overview.

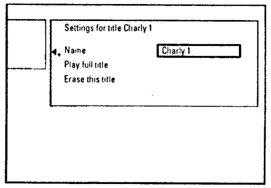
The process of splitting the title is now complete.

Editing recording titles (name)

Some TV stations transmit the title (name) of a programme. In this case, the name will be included automatically (e.g. 'ROCKY'). Otherwise, the only the programme number (programme name) and the time are stored as the name of the recording. The name of the recording can only be changed after the recording has been completed.

❶ If required, press the **STOP ■** button to interrupt playback.

❷ Using ▲ or ▼ select the title whose name you want to edit and confirm with ▶ .
→ The menu for editing names appears.



❸ Select '***Name***' using ▲ or ▼ and confirm with ▶ .

❹ Using ▶ or ◀ select the position where the letter/number/icon is to be changed/re-entered.

❺ Change the icon using ▲ or ▼ .

O You can switch between upper and lowercase using **SELECT** .

O You can delete the character using **CLEAR** .

How can I enter the characters with the buttons 0..9 ?
Press a number button as often as the required character or the number appears. You can enter language dependent characters with the buttons **I◀◀** *or* **▶▶I** *on the corresponding character e.g.: ä, button* **2** *for 'a' and then with* **▶▶I** *as often as 'ä' appears.*
For special characters press the button **1** *repeatedly.*
The position for the following character will be selected automatically.
To enter a space press the button **1** *.*
To erase a character press **CLEAR** *.*

❻ Repeat ❹ and ❺ until you have made the changes you want.

❼ Save the new name with **OK** .
→ '***Storing name***' appears on the TV screen for confirmation.

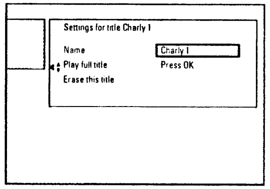
❽ To end, press ◀ .

Managing the disc contents

Playing the entire title

If you have hidden certain sections (chapters) of a title, this setting lets you watch the entire title including the hidden sections. To do this, proceed as follows:

❶ Press the **STOP ■** button or during playback press **DISC MENU** .



❷ Using ▲ or ▼ select the title you want to play all of and confirm with ▶ .
→ The title editing menu will appear.

❸ Select '***Play full title***' using ▲ or ▼ and confirm with **OK** .

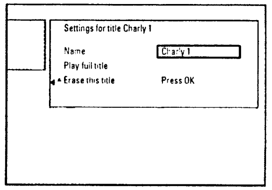
→ Playback starts automatically. The title is played in its entirety - including the hidden chapters.

Erasing recordings/titles

You can erase specific recordings from a disc. To do this, proceed as follows:

❶ Press the **STOP ■** button or during playback press **DISC MENU** .

❷ Using ▲ or ▼ select the title you want to delete and confirm with ▶ .
→ The title editing menu will appear.



❸ Select '***Erase this title***' using ▲ or ▼ and confirm with **OK** .
→ '***This will completely erase this title***'. '***Press OK to confirm***' appears on the TV screen.

O If you want to delete this title, press **OK** to confirm.

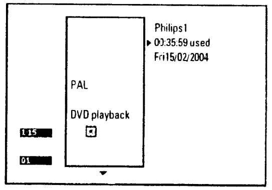
O Otherwise press ◀ .

❹ '***Erasing title***' appears on the TV screen.

❺ At this point '***Empty title***' appears in the 'index picture display'. A new recording can now be made here.
If the deleted title was very short (less than 1 minute) '***Empty title***' will not appear at this point.

Can titles be deleted from a DVD+R disc?
Titles on DVD+R discs are only marked as deleted. ***'Deleted title'*** *will appear in the display instead of* ***'Empty title'****. During playback the 'deleted' title is skipped. The space used for this title cannot be used again as the title has not been physically deleted. Once the disc has been finalised no further changes can be made.*

Disc settings


Philips1
00:35:59 used
Fri15/02/2004
PAL
DVD playback

This screen appears **before** the first title and contains general information about the current disc.

You can:
•) change the name of the disc
•) activate or deactivate write protection on the disc
•) Finish editing (make the disc DVD compatible)
•) finalise a DVD+R
•) delete a DVD+RW

To get to this display, proceed as follows:

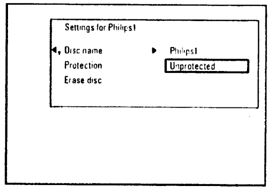
❶ Press the **STOP ■** button or during playback press **DISC MENU** .

❷ Select the first title with ▲ or press **STOP ■** . **STOP ■** .

❸ Press ▲ .
→ The disc info display will appear.

Changing the disc name

❶ In the 'Disc info display' press ▶ .
→ The '***Settings for***' menu appears on the TV screen.


Settings for Philips1
Disc name ▶ Philips1
Protection Unprotected
Erase disc

❷ Select '***Disc name***' using ▲ or ▼ and confirm with ▶ .

❸ Using ▶ or ◀ select the position where the letter/number/icon is to be changed/re-entered.

❹ Change the icon using ▲ or ▼ .
- You can switch between upper and lowercase using **SELECT** .
- You can delete the character using **CLEAR** .

❺ Repeat ❸ and ❹ until you have made the changes you want.

❻ Save the new title with **OK** .
→ '***Storing name***' appears on the TV screen for confirmation.

❼ To end, press ◀ .

Finishing editing

If one or more titles have been edited a DVD player may still display the original titles. You can prepare your DVD+RW disc in such a way that a DVD player will be able to play the edited version.

❶ In the 'Disc info display' press ▶ .
→ The '***Settings for***' menu appears on the TV screen.

❷ Select '***Make edits compatible***' using ▲ or ▼ and confirm with **OK** .

× ***'Make edits compatible' does not appear***
✓ *Your disc is already compatible. There is no need for conversion. To end, press* **SYSTEM MENU** .

❸ The screen displays '***This will take***' to show how long the process will last.

❹ To confirm press **OK** .
→ '***Working...***' appears on the TV screen.
→ bar will move from left to right indicating progress.

Finalising DVD+R discs

This feature is required to play back a DVD+R disc in a DVD player. Once the disc has been finalised no further recordings or changes can be made.

❶ In the 'Disc info display' press ▶ .
→ The '***Settings for***' menu appears on the TV screen.

❷ Select '***Finalise disc***' using ▲ or ▼ and confirm with **OK** .

× ***'Finalise disc' does not appear***
✓ *Either there is no DVD+R disc inserted or the disc is already finalised. To end, press* **SYSTEM MENU** .

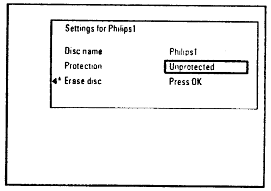
× ***The 'Settings for' menu does not appear***
✓ *The menu may not appear if the disc has been recorded on another DVD recorder. In this case, use the* '***Finalise disc***' *feature in the '*🛠*' menu, under* '***Features***'.

❸ The screen displays '***This will take...***' to show how long the process will take.

❹ To confirm press **OK** .
→ '***Working...***' appears on the TV screen.
→ A bar will move from left to right indicating progress.

Erasing DVD+RW Disc's

❶ In the 'Disc info display' press ▶ .
→ The '***Settings for***' menu appears on the TV screen.


Settings for Philips1
Disc name Philips1
Protection Unprotected
Erase disc Press OK

❷ Select '***Erase disc***' using ▲ or ▼ and confirm with **OK** .
→ '***This will erase all titles Press OK to confirm***' appears on the TV screen..

❸ If you want to delete all the titles, press **OK** to confirm. Otherwise press ◀ .
→ '***Erasing disc***' appears on the TV screen.
After deletion, the index picture display shows the free space on the disc.

If the disc is empty already, you cannot select '***Erase disc***'.

Programming a recording (TIMER)

General

Use 'Programming a recording (TIMER)', to automatically start and stop a recording at a later date.

The DVD recorder will switch to the right programme number and begin recording at the correct time.
With this DVD recorder, you can pre-programme up to six recordings within a period of one month.

To make a programmed recording, your DVD recorder needs to know:
* the date you want to make the recording
* the programme number of the TV channel
* the start and stop time of the recording
* VPS or PDC on or off
* the recording mode (picture quality) ('***M1/M2/M2x/M3/M4/M6/M8***')

Fit to space Recording
*You can select also the recording mode '**FR**'.*
*With these setting the recording mode (bit rate) will be automatically calculated to use the complete empty space (title '**Empty**').*
If the empty space is too small the recording will be stopped to prevent the following titles from being overwritten.

This information is saved in a 'TIMER block'.
Before you begin, make sure the clock is set. If the clock is not set, the '***Time/Date***' menu will appear when you press the **TIMER** ⊕ button.

What is 'VPS/PDC'?
- 'VPS' (Video Programming System)/'PDC' (Programme Delivery Control) are used to control the start and duration of TV channel recordings. If a TV programme starts earlier or ends later than was scheduled, the DVD recorder will then turn on and off at the correct time.

What do I need to know about 'VPS/PDC'?
*- Usually the start time is the **same** as the VPS or PDC time. If a different 'VPS/PDC time' is indicated, e.g.: '20.15 (VPS/PDC 20.14)', the **VPS/PDC time** '20.14' must be entered **exactly to the minute** during programming.*
If you want to programme a time that is different from the VPS or PDC time, you must switch off VPS or PDC.
- Only one TV program of a TV channel can be controlled using 'VPS/PDC' at a time. If you want to record two or more TV programmes on a TV channel using 'VPS/PDC', you will need to programme these as two separate recordings.
- Since the DVD recorder requires a certain lead time (for getting the disc up to speed and positioning the laser) before recording can start, it is possible that the recorder will miss the first few seconds of a TV show recorded with VPS/PDC.
In this case, disable VPS/PDC and enter a start time one minute earlier.

Programming recordings with the ShowView® System

SHOWVIEW®

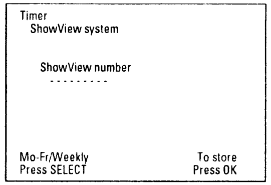
Thanks to this programming system, you no longer need to tediously enter the date, programme number, start and finish times. All the information needed by the DVD recorder for programming is contained in the ShowView® programming number. This 9-digit ShowView® number is found in most TV listings magazine.

❶ Switch on the TV set. If required, select the programme number for the DVD recorder.

❷ Press **TIMER** ⊕ on the remote control.
The programming method selected last is marked.

❸ Select '***ShowView system***' using ▼ or ▲ and confirm with ▶ .

❹ Enter the entire ShowView number. This number is up to 9 digits long and can be found next to the start time of the TV programme in your TV listings magazine.
e.g.: 5-312-4 or 5,312 4
Enter 53124 for the ShowView-number.
If you make a mistake, you can clear your instructions with **CLEAR**.



```
Timer
  ShowView system

    ShowView number
    ---------

Mo-Fr/Weekly                        To store
Press SELECT                        Press OK
```

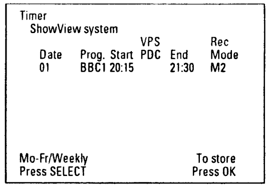
Selecting daily/weekly recordings
*Using **SELECT**, select from the following options:*
*'**Mo-Fr**': Repeated daily recordings (Monday to Friday).*
*'**Weekly**': Repeated weekly recordings (every week on the same day).*

❺ Confirm with **OK**.

× ***The following message appears on the screen: 'Please enter programme number'***
✓ *The programme number of the TV channel has not yet been assigned to the ShowView number. Use ▶ , ◀ or the number buttons **0..9** on the remote control to select the appropriate programme number (name) of the TV channel and confirm with **OK**.*

× ***The following message appears on the screen: 'ShowView number wrong'***
✓ *The entered ShowView number is incorrect. Repeat the entry or cancel using the **SYSTEM MENU** button.*
✓ *Check the time/date (see 'Setting the time & date' in 'Installing your DVD recorder').*

× ***The following message appears on the screen: 'Weekend programming not possible'***
✓ *A daily recording was entered for the wrong day. Daily programming can only be used for recordings to be made from Monday to Friday.*



```
Timer
  ShowView system
                           VPS            Rec
  Date    Prog. Start  PDC   End     Mode
  01      BBC1 20:15          21:30   M2


Mo-Fr/Weekly                        To store
Press SELECT                        Press OK
```

→ The decoded data appears after confirmation. You can go back and change the data. Select the appropriate input field with ▶ or ◀ . If required, make changes using ▲ , ▼ or the number buttons **0..9** .

'Switching on 'VPS/PDC' in the 'Start' input field
*Select the '**Start**' input field using ▶ . Using **SELECT** switch on 'VPS/PDC' ('*' lights up). If you press **SELECT** again, you will switch 'VPS/PDC' off ('*' goes out).*

Changing the recording mode in input field 'End'
*Select the '**End**' input field using ▶ .*
*Use **REC MODE** to select the recording mode '**M1, M2, M2x, M3, M4, M6, M8**'.*

Fit to space Recording
*You can select also the recording mode '**FR**'.*
*With these setting the recording mode (bit rate) will be automatically calculated to use the complete empty space (title '**Empty**').*
If the empty space is too small the recording will be stopped to prevent the following titles from being overwritten.
Do not use this function under the following conditions:
•) more then one programmed recording
•) daily/weekly repeated recordings
•) recordings with VPS/PDC
May be the calculation of the recording mode can not function properly.

❻ If all information is correct, press the **OK** button. The programming information is stored in a TIMER block.

❼ To end, press **TIMER** ⊕.

❽ Insert a recordable disc (one without write protection).
The inserted disk is checked.

❾ Search the position on the disc where the recording should begin.
Press **STOP ■** .

❿ Switch off the DVD recorder using **STANDBY** ⏻ .
The programmed recording functions only if the DVD recorder has been **switched off** using **STANDBY** ⏻ .

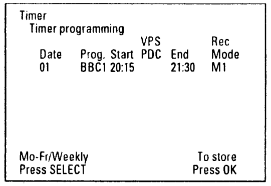
If one or more recordings have been programmed '***TIMER***' will light up on the display.

ENGLISH

Programming recordings without the ShowView® System

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press **TIMER** ⊕ on the remote control.
→ The programming method selected last is marked.



```
Timer
  Timer programming
                           VPS            Rec
  Date    Prog. Start  PDC   End     Mode
  01      BBC1 20:15          21:30   M1


Mo-Fr/Weekly                        To store
Press SELECT                        Press OK
```

❷ Select line '***Timer programming***' with ▼ or ▲ . and confirm with the ▶ button.
→ The information will appear on the screen.

❸ Select the input field with ◀ or ▶ .

❹ Enter information with ▼ or ▲ or with the number buttons **0..9** .

Programming a recording (TIMER)

Selecting daily/weekly recordings

*In '**Date**' use* **SELECT** *to select from the following options:*
*'**Mo-Fr**': Repeated daily recordings from Monday to Friday*
*'**Mon**': Repeated weekly recordings (every week on the same day, e.g. Monday).*

Programme numbers of the 'EXT1' and 'EXT2' scart socket

You can also programme recordings from external sources via scart socket **EXT1 TO TV-I/O** *('EXT1') or* **EXT2 AUX-I/O** *('EXT2').*

'Switching on 'VPS/PDC' in the 'Start' input field

*Select the '**Start**' input field using* **TIMER** ⏲ *. Using* **SELECT** *switch on 'VPS/PDC' ('*' lights up). If you press* **SELECT** *again, you will switch 'VPS/PDC' off ('*' goes out).*

Changing the recording quality in input field 'End'

*Select the '**End**' input field using* ▶ *.*
Use **SELECT** *to select the recording mode.*

5 If all information is correct, press the **OK** button.
→ The programming information is stored in a TIMER block.

6 To end, press **TIMER** ⏲ .

→ The disc you have inserted will be checked.

7 Search the position on the disc where the recording should begin.

8 Switch off with **STANDBY** ⏻ .
The programmed recording will only function properly if the DVD recorder has been **switched off** using the **STANDBY** ⏻ button.

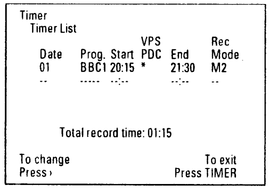
If any of the TIMER blocks are in use, '*TIMER*' will light up on the recorder display.

How to change or delete a programmed recording (TIMER)

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

1 Press **TIMER** ⏲ on the remote control.
→ The programming mode selected last is marked.

2 Select '*Timer List*' using ▼ or ▲ and confirm with ▶ .



```
Timer
  Timer List
                          VPS         Rec
     Date   Prog. Start  PDC   End    Mode
     01     BBC1  20:15  *     21:30  M2
     --     ----- --:--        --:--  --


         Total record time: 01:15

To change                          To exit
Press ›                       Press TIMER
```

3 Select the programmed recording (TIMER) you want to check, change or delete with ▼ or ▲ .

Delete programmed recording

4 Press the **CLEAR** button.

5 Confirm with **OK** . '*Timer Cleared*' will briefly appear on the TV screen.
'-- ---' appears rather than the displayed values

6 Press ▶ .
Select the input field with ◀ or ▶ .
If required, change the information with ▲ , ▼ or the number buttons **0..9** .

7 Confirm with **OK** .

8 To end, press **TIMER** ⏲ .

9 Switch off with **STANDBY** ⏻ .

'NexTView Link'

This DVD recorder is equipped with the 'NexTView Link' feature. If your television is also equipped with 'NexTView', you can mark TV programmes on the television for programming. These TV programmes will automatically be transmitted to a TIMER block on the DVD recorder.
If you clear the marking of the TV programme on the television, the corresponding TIMER block on the DVD recorder will also be cleared. For more information, read the instruction manual of your TV set.

Problem solving for programmed recordings

PROBLEM	SOLUTION
The DVD recorder is not responding	✓*While a programmed recording is being made, you cannot operate your DVD recorder manually. If you want to cancel the programmed recording, press* **STANDBY** ⏻ .
'*Switch off, timer recording*' flashes on the TV screen.	✓*The DVD recorder was switched on a few minutes before the start of a programmed recording.* *Switch off the DVD recorder using* **STANDBY** ⏻ *. A programmed recording (timer) will only function if the DVD recorder is switched off (* **STANDBY** ⏻ *button).*
Error message: '*Insert recordable disc*'	✓*Either a disc has not been inserted or the disc cannot be used for recording. Insert a disc on which recordings can be made.* *Search the position on the disc where you want the recording to begin.* *Switch off the DVD recorder using* **STANDBY** ⏻ .
The error message '*Disc locked*' appears briefly on the screen.	✓*A write-protected disc has been inserted. Undo the write protection (see 'Preventing accidental erasing of discs' in 'Manual recording') or insert a different disc.*
Error message: '*Memory full*'	✓*If this error message appears after pressing* **TIMER** ⏲ *, then all TIMER blocks are already programmed. No more recordings can be programmed. Press the* ▶ *button. If you want to clear or check a programmed recording (TIMER block), select it with* ▲ *or* ▼ .
The '*Data error*' message appears on the screen.	✓*The data for the recording could not be transferred. Please check date, start time and finish time of the programmed recording.*
The '*Collision*' message appears on the screen.	✓*Two programmed recordings overlap.* ✓*If you ignore this error message the show with the earlier start time will be recorded first. The start of the second show will not be recorded.* ✓*Change the setting for either of the two recordings.* ✓*Clear either of the two recordings.*

User preferences

General

This section describes how you can make additional personal settings. The symbols have the following meaning:

Picture settings

Sound settings

Language settings

Additional settings

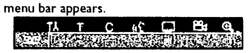
Disc settings

Record settings

Installation

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menu bar appears.



If this menubar is not complete visible on your wide screen TV-set, change the picture settings on your TV.

❷ Select 'T⅄' using ◀ oder ▶ and confirm with

❸ Select the corresponding function using ▼ or ▲ and confirm with ▶ .

❹ Select the corresponding line using ▼ or ▲ and confirm with ▶ . For more information on each function, read the following pages.

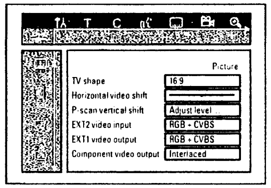
❺ Select the corresponding function using ▼ or ▲ , or the setting with ◀ or ▶ . Select the functions you want to change as described in the following pages.

❻ Confirm the new setting with **OK** .

❼ Close the menu item with ◀ .

Picture settings

In this menu you can adapt the picture from the DVD-Recorder to your TV set.
Additionally you can adjust the Colour, the Brightness, the Contrast, for playback from the internal tuner or input sockets seperately



Picture
TV shape 16:9
Horizontal video shift
P-scan vertical shift Adjust level ..
EXT2 video input RGB + CVBS
EXT1 video output RGB + CVBS
Component video output Interlaced

'TV shape'

The picture signal from your DVD recorder can be set to match your TV set:

- ○ *'4:3 letterbox'*
  for a widescreen picture with black bars at the top and bottom
- ○ *'4:3 panscan'*
  for a full-height picture with the sides trimmed.
- ○ *'16:9'*
  for a widescreen TV set (16:9 screen ratio)

'Horizontal video shift'

Use this feature to adjust the position of the picture on your TV left or right using ◀ , ▶ to suit the screen of your TV set.

'P-scan vertical shift'

Use this feature to adjust the position of the picture on your TV down or up using ▼ , ▲ to suit the screen of your TV set.

'EXT1 video output', 'EXT2 video input'

Since RGB and S-VIDEO signals sometimes use the same connections on a scart cable, the two signals cannot be transmitted simultaneously. With these settings, you can decide whether RGB or S-VIDEO signals are to be transmitted. This setting affects only the scart sockets of the DVD recorder (*'EXT1 video output'*: Output socket **EXT1 TO TV-I/O** and *'EXT2 video input'*: Input socket **EXT2 AUX-I/O**)
Please also observe which signals are available at which scart socket of the TV set or how the scart sockets need to be switched.
If necessary, consult the instruction manual of your TV set.

User preferences

'EXT2 video input'

- ○ *'RGB + CVBS'*
  Depending on the TV set you are using, switching between the 'RGB' and the 'Video(CVBS/FBAS)' signal is done automatically.
- ○ *'S-video only'*
  On the scart socket **EXT2 AUX-I/O** only the S-Video signal will be processed.
  Please observe that when making recordings from a video recorder that transmits only video (CVBS/FBAS) signals through the scart cable, recordings may be made in black and white.
  Therefore, use this setting with caution.

'EXT1 video output'

- ○ *'RGB + CVBS'*
  Depending on the TV set you are using, switching between the 'RGB' and the 'Video(CVBS/FBAS)' signal is done automatically. If the picture scrolls to the side or colour quality problems appear on some TV sets when the setting is *'RGB + CVBS'*, you must select *'CVBS only'*.
- ○ *'S-video only'*
  On the scart socket **EXT1 TO TV-I/O** only the S-Video signal will be processed.
  In case the scart socket of the TV set is not suitable for S-VIDEO (Y/C) signals, you will only see a black&white picture,
- ○ *'CVBS only'*
  Only the video (CVBS/FBAS) signal is transmitted, regardless of the video signals (RGB, Y/C) at the scart sockets. This setting is selected automatically when no 'RGB' or 'S-VIDEO' signal is detected at the scart socket. USe this setting if picture disturbance occurs on your TV set with the setting *'RGB + CVBS'*.

When selecting the settings *'S-video only'* or *'CVBS only'*, the RGB signal is switched off.

'Component video output'

This allows you to switch the Component Video signal between 'Interlaced' and 'Progressive Scan.'
Warning If your TV has separate connections for 'Interlaced' and 'Progressive Scan' or it does not switch automatically between the two, it is possible that no picture will appear on the TV after it is switched from one to the other.

❶ Select the setting you need with **SELECT** . Choose Progressive Scan only if your TV has Progressive Scan.

❷ Confirm with **OK** .

× ***No picture appears on the TV after switching***
Überprüfen Sie die Anzeige im Anzeigefeld des DVD-Recorders:
Check the display of your DVD recorder.
'PRO': 'Progressive Scan' is on
No display: 'Interlaced' is on. Switch your TV to the corresponding input jack or select the corresponding connection. You can also switch the Component video output signal as follows:
- Disconnect the recorder's power cord.
- Hold down ⏮ on the DVD Recorder while reconnecting the power cord. 'PRO' (progressive scan) appears on the display.
- If you want to switch back, hold down ⏮ until 'PRO' disappears from the display. The DVD Recorder is switched to 'Interlaced.'

'Black level shift'

Adapts the colour dynamics for NTSC playback when switched to *'On'*

Colour and Contrast settings

This menu appears if you select the line *'Black level shift'* and press ▼ once.
Here you can set different settings for the signals at the input sockets **EXT1 TO TV-I/O** , **EXT2 AUX-I/O** , **S VIDEO/VIDEO in** , **DV IN** or at the internal tuner.

❶ Select the programm numbers of the input socket or the internal tuner.using **CHANNEL +** , **CHANNEL −** .

❷ Select the appropriate line and confirm using ▶ .

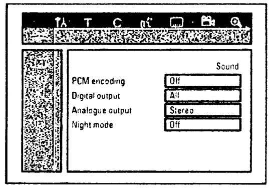
❸ Change the settings with ◀ , or ▶ .

❹ Store the settings using **OK** .

❺ Select another line or end using **SYSTEM MENU** .

Sound settings

You can select the settings in this menu depending on which audio outputs are used.
If you only use the analogue audio output (red and white socket **AUDIO OUT L/R**), select the setting *'Off'* in the *'Digital output'* menu.



Sound
PCM encoding Off
Digital output All
Analogue output Stereo
Night mode Off

'PCM encoding'

- ○ *'On'*
  The audio recording will be done in PCM-sound
- ○ *'Off'*
  The audio recording will be done in Dolby Digital

'Digital output'

You can select one of the following settings for devices that are connected to the **COAX OUT** or **OPTICAL OUT** sockets:

- O *'All'*
  Dolby Digital and DTS signals are fed unaltered to the digital output. MPEG-2 multi-channel signals are converted to PCM (Pulse Code Modulation).
  For receivers/amplifiers **with digital multi-channel decoders.**
- O *'PCM only'*
  Digital and MPEG-2 multi-channel signals are converted to PCM (Pulse Code Modulation). For receivers/amplifiers **without digital multi-channel decoders.**
- O *'Off'*
  Digital output switched off.
  For devices **with analogue audio input.**

'Analogue output'

You can select one of the following settings for devices that are connected to the analogue audio output ():

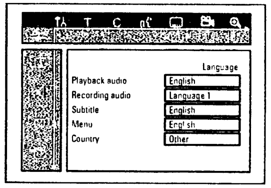
- O *'Stereo'*
  For devices without DolbySurround or TruSurround. Use this setting if the DVD recorder is only connected to a stereo TV set.
- O *'Surround'*
  Dolby Digital and MPEG-2 multi-channel are mixed down to a Dolby Surround-compatible two-channel output signal.
  For devices **with Dolby Surround / Pro Logic Decoder** .

'Night mode'

Night mode optimises the sound for playback at low volume. You are therefore less likely to disturb your neighbours. This only works with Dolby Digital audio on DVD video discs.

Language settings

You can select the following settings in this menu:


Language
Playback audio English
Recording audio Language 1
Subtitle English
Menu English
Country Other

'Playback audio'

Playback audio language.

'Recording audio'

Wahl der Audio-Aufnahme bei zweisprachigen Sendungen

'Subtitle'

Subtitle language

'Menu'

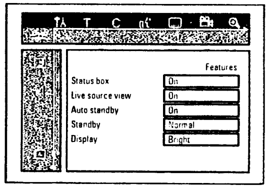
Screen menu language

'Country'

Selection of the location

Additional settings

You can select the following functions in this menu:


Features
Status box On
Live source view On
Auto standby On
Standby Normal
Display Bright

'Status box'

Along with the on-screen menus, the OSD (On Screen Display) also displays information on the current operating status (counter, playback, recording, TV channel, ...) on the TV screen.
You can switch off the information about the operating status so that the on-screen display is not recorded when making recordings on additional devices.

- O *'On'*
  The OSD information appears for a few seconds in each selected mode and then disappears.
- O *'Off'*
  The OSD information is switched off. It is **no longer** displayed on the screen.

'Live source view'

With this function you can switch between the live picture or the information of the selected TV channel/input socket in the 'Tuner information box' (left-hand corner of the screen).

'On'
The live picture of the selected TV channel or signal on the input sockets is visible.

- O *'Off'*
  The information about the selected TV channel or signal on the input sockets is visible.

'Auto standby'

If you haven't used the DVD-recorder for a few minutes in certain modes (e.g.: STOP), it will switch to standby automatically. You can cancel this function to use the DVD-recorder as a television receiver.

- O *'On'*
  The DVD-Recorder leave switched on.
- O *'Off'*
  The DVD-Recorder will be switched to standby after few minutes.

'Standby'

You can switch off the clock display on your DVD recorder to save energy. Programmed recordings will be carried out despite of this.
Zusätzlich können Sie die wichtigsten Funktionen des DVD-Recorders im Anzeigefeld in Laufschrift darstellen (Demo).

- O *'Low power'*:
  When the DVD recorder was switched off using **STANDBY ⏻** , the clock display is also switched off.
- O *'Normal'*:
  When the DVD recorder was switched off using **STANDBY ⏻** , the clock display remains visible.
- O *'Demo mode'*:
  When the DVD recorder is switched off using **STANDBY ⏻** , a list of the most important features appears in the display.

'Display'

You can change the brightness of the display on the DVD recorder. This setting only affects the DVD recorder when it is switched on.
You can also adjust this setting using the **DIM** button on the remote control.

- O *'Bright'*:
  The display appears with normal brightness. The disc tray light is switched on.
- O *'Dimmed'*:
  The display appears less bright. The disc tray light is switched off.
- O *'Off'*:
  The display and the disc tray light are switched off.

Fernbedienungseinstellung

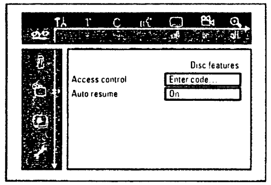
In diesem Menü können Sie die Art der Fernbedienung einstellen, auf die Ihr DVD-Recorder reagieren soll

- O *'DVD player'*
  Der DVD-Recorder reagiert auf die mitgelieferte Fernbedienung und auf die Fernbedienung eines DVD-Players (Fernbedienungscode RC-6).
  Wählen Sie diese Einstellung, wenn die Fernbedienung Ihres Philips-Fernsehgerätes DVD-Funktionen unterstützt.
- O *'DVD recorder'*
  Der DVD-Recorder reagiert nur auf die mitgelieferte Fernbedienung.

User preferences

Disk feature menu

In this menu, you can make changes that relate to the disc:



'Access control'

Please read the next chapter 'Access control (child lock)'.

Auto resume

If playback of a pre-recorded DVD video disc or video CD is interrupted (using **STOP ■** or **OPEN/CLOSE ⏏**), playback will resume where it stopped after you reinsert the disc. This applies not only to the current disc but also to the last 20 discs you played.

You can switch off this feature if you do not want it.

'PBC'

This line appears only if you insert a VCD.
Using this function, you can activate or deactivate the PBC menu (Playback Control) of a Video CD. For more information, read section 'Playing a (Super) Video CD' in chapter 'Playback'.

'Finalise disc'

This function allows you to finalise DVD+R discs. If the disc has already been finalised, this line will appear darker.

'Adapt disc format'

If a DVD+RW has been recorded in a PC drive or a different DVD recorder, the index screen may not be displayed properly.
This feature allows you to adjust the format of the disc.
Therefore, this feature is only visible if the disc format is different.

Access control (Child Lock)

Child lock (DVD and VCD)

This feature enables discs to be locked for children.
When Child Lock is on, a 4-digit code (PIN) needs to be entered before a disc can be played.
You can also decide whether the inserted disc should always be played or should be played only once, despite the child lock

•)'*Play always*':
This disc is stored in a memory with space for 50 child-safe discs. If more than 50 discs are stored, the last disc in the list is removed and the new disc is added. The screen shows 'Child safe' at the start of playback.

•)'*Play once*':
This disc is only authorised for single playback. If the recorder is switched off, the PIN code must be re-entered.

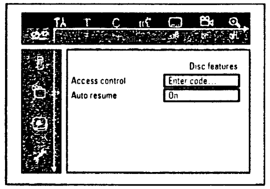
Activating/deactivating child lock

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menubar appears on the screen.

❷ Select the 'TA' icon using ◄ or ► .

❸ Select '*(Disc features)*' using ▼ or ▲ and confirm with ► .



❹ Confirm '*Access control*' using ► .

❺ Enter a 4-digit code of your choice.
→ If the code is new, you may have to enter the code a second time as confirmation.

❻ Select '*Child lock*' using ▲ or ▼ and confirm with ► .

❼ Select the '🔓' icon using ▼ or ▲ .

❽ Confirm with **OK** .

❾ Quit the feature using ◄ and **SYSTEM MENU** .

Unauthorised discs can only be played by entering the four-digit PIN code.
To deactivate the child lock, select the '🔓' icon in ❼ .

Authorising a disc

❶ Insert a disc. The access control box will appear after a short delay.

❷ Using ▲ or ▼ select '*Play once*' or '*Play always*'.

❸ Enter your PIN code using the number buttons **0..9** .

Double-sided DVDs may have a different ID for each side. For these discs, each side must be authorised. Video CDs may have a different ID for each disc. For these CDs, each disc must be authorised.

ENGLISH

Locking unlocked discs

To lock a disc that was formerly authorised follow the instructions below

❶ Insert a disc. Playback starts automatically. If the playback does not start automatically, press **PLAY ►** .

❷ Press the **STOP ■** button while the '-safe-' icon is visible. The icon changes to '-locked-'. The disc is now locked.

Access control (Child Lock)

Parental level control (DVD video only)

Films on pre-recorded DVD discs may contain scenes not suitable for children. Therefore, some discs may contain 'Parental Control' rating information that applies to the entire disc or to certain scenes on the disc.
The appropriate scenes have filter values that reach from 1-8. If such a scene is detected during playback, the filter value set on the DVD recorder is compared to the scene. If the filter value is higher than the setting, an alternative scene will be played (if available).
Most DVDs apply the rating to an entire DVD. Therefore, if certain scenes exceed the rating you select, the entire disc will be blocked from viewing.

Activating/deactivating parental level control

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

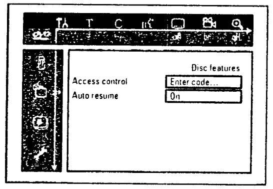
❶ Press the **SYSTEM MENU** button on the remote control.
→ The menubar appears.

❷ Select the 'TA' icon using ◀ or ▶ .

❸ Press the **SYSTEM MENU** button on the remote control.

❹ Select the 'TA' icon using ◀ or ▶ .

❺ Select '(*Disc features*)' using ▼ or ▲ and confirm with ▶ .



❻ Confirm '*Access control*' using ▶ .

❼ Enter a 4-digit code of your choice. If the code is new, you may have to enter the code a second time as confirmation.

❽ Select the '*Parental level*' using ▲ or ▼ and confirm with ▶ .
A bar appears to select the parental level.

❾ Select the appropriate rating using ▼ , ▲ or the number buttons **0..9** .

What do the ratings mean?
Rating 0 (displayed as '--') parental control not active.
Rating 1 (suitable for children)
Rating 8 (only suitable for adults)

What happens if a DVD scene contains a higher level than the rating set?
If the recorder does not find a suitable alternative, playback will stop and you must enter the four-digit code.

❿ Confirm with **OK** . Quit using ◀ and **SYSTEM MENU** .

Changing the country

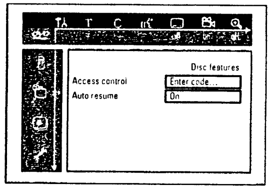
The set filter values depend on the respective country. It is therefore necessary to enter the country to which these filter values apply.

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menubar appears on the screen.

❷ Select the 'TA' icon using ◀ or ▶ .

❸ Select line '(*Disc features*)' using ▼ or ▲ and confirm with ▶ .



❹ Confirm the line '*Access control*' using ▶ .

❺ Enter your four-digit code. If the code is new, you may have to enter the code a second time as confirmation.

❻ Select '*Change country*' using ▼ or ▲ and confirm with ▶ .

❼ Select the corresponding country using ▲ or ▼ and confirm with **OK** .

❽ To end, press ◀ and then **SYSTEM MENU** .

Access control (Child Lock)

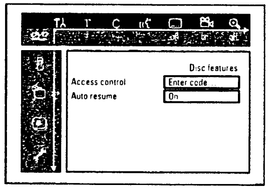
Changing the PIN code

Preparation:
•) Switch on the TV set, and if necessary, select the programme number for the DVD recorder.
•) Switch on the DVD recorder.

❶ Press the **SYSTEM MENU** button on the remote control.
→ The menubar appears.

❷ Select the 'TA' icon using ◀ or ▶ .

❸ Select '(*Disc features*)' using ▼ or ▲ and confirm with ▶ .



❹ Confirm '*Access control*' using ▶ .

❺ Enter your four-digit PIN code. If the code is new, you may have to enter the code a second time as confirmation.

❻ Select '*Change code*' using ▲ or ▼ and confirm with ▶ .

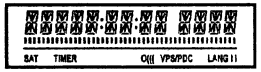
❼ Enter the new code using the number buttons **0..9** . Enter the same code again as confirmation.

❽ Quit using ◀ and **SYSTEM MENU** .

I have forgotten my code
Press **STOP ■** *four times (step* ❺ *), then press* **OK** *. Access control is now switched off. You can now enter a new code as described above.*

Access control (Child Lock)

The symbols on your DVD recorder display



These symbols can light up on your DVD recorder display:

Multi-function display/text line
- •) Clock
- •) Disc/title playing time
- •) OTR switch-off time
- •) Title name
- •) Display of the programme number of the TV channel/playing time/channel name/function.
- •) Display of information and alerts

IIIIIIIIIIIII Disc bar : Displays the current position on the disc (disc pointer).
Play/Record: Single flashing segment at the current position.
Pause: Flashing segment on both sides of the current position.
Stop: Illuminated segment at the current position.

SAT An automatic recording from a satellite receiver (SAT recording) has been programmed.

TIMER A recording (timer) has been programmed
Die Anzeige blinkt, wenn eine programmierte Aufnahme nicht durchgeführt werden kann. Der DVD-Recorder ist entweder eingeschaltet, oder es ist eine gesperrte DVD+RW/+R eingelegt.

PRO Component Video output switched to 'progressive scan'. If this display does not appear, the Component Video output is switched to 'interlaced'.

o(((A remote control signal has been received

VPS/PDC Video programming system / programme delivery control: A VPS or PDC code is transmitted for the selected TV program

LANG II During playback a 2-channel tone was detected or a 2-channel tone was received. 'I' or 'II' lights up depending on which sound channel has been selected

Messages in the DVD recorder display

The following messages may appear in your DVD recorder display

IS TV ON? The DVD recorder is in initial installation mode. Switch the TV on, then read the paragraph on 'Initial installation' in 'Installing your DVD recorder'.

NO SIGNAL No input signal available (signal inadequate or unstable)

MENU The menu on the screen is active

OPENING Disc tray opening

TRAY OPEN Disc tray open

CLOSING Disc tray closing

READING Disc being read

MENU UPDT Once recording has been successfully completed on a DVD+RW/+R the table of contents is created.

INIT MENU The menu structure is created after the first recording has been made on a new disc

COPY PROT You received a copy-protected signal. This may come from a copy-protected DVD/videotape of a DVD/video player or from a TV channel.
During the display COPY PROT no recording will be made. A running recording will be interrupted.

WAIT Please wait until this message disappears. The DVD recorder is busy performing a task.

NO DISC A disc has not been inserted for recording. If a disc has been inserted, it cannot be read.

INFO Information about the inserted DVD is displayed on the screen

BUSY The DVD recorder is processing the changes to make the disc DVD compatible

ERASING The entire DVD+RW is being erased

EMPTYDISC The DVD+RW/+R inserted is either new or has been completely erased (no recordings).

PROTECTED The DVD+RW/+R inserted is protected against recording.

MAX TITLE The maximum number of titles per disc has been reached. The maximum number of titles on a disc is 48.

MAX CHAP The maximum number of chapters within a title/or the disc has been reached. The maximum number of chapters within a title is 99, on a disc 255. (spreaded over the whole disc).

DISC FULL The disc is full. There is no space for new recordings

PAL DISC A disc with PAL recordings has been inserted. The machine is trying to record an NTSC signal. Insert a new disc or one that contains NTSC recordings.

NTSC DISC A disc with NTSC recordings has been inserted. The machine is trying to record a PAL signal. Insert a new disc or one that contains PAL recordings.

RECORDING An illegal action (e.g. **OPEN/CLOSE ▲** button) was attempted during recording.

FREETITLE An empty title is selected.

DISC LOCK An attempt has been made to record during playback of a protected disc. This message appears if an attempt is made to insert a chapter marker (**EDIT** button).

DISC ERR An error occurred when reading the title. If this error keeps occurring, please clean the disc or use a new one. For instructions on how to clean a disc see the section on 'Cleaning the discs' in the next chapter.

DISC WARN An error occurred when writing the title. Recording was continued; the error was skipped

SETUP After the automatic search the menu for setting the date/time will appear on the screen.

WAIT 01 During the automatic channel search the TV channels found will be counted.

BLOCKED The disc tray cannot be closed/opened.

SAFE REC The new recording will be added at the end of all the other recordings (SAFE RECORD).

EASYLINK Data transfer 'EasyLink' from the TV is in progress

POST-FORMAT After the creation of the menu structure the disc is prepared. As long as 'POST-FORMAT' is visible on the display you can not operate the DVD-Recorder.

PHILIPS The DVD-Recorder has been switched on

STANDBY The DVD-Recorder has been switched off

PHOTO The 'Digital Photo Manager' is switched on

VIDEO The 'Digital Photo Manager' will be switched off

SAVING Data will be written on the inserted memory card or on a DVD+RW/+R

4. Mechanical Instructions

4.1 Dismantling and Assembly of the Set

Remark: Exploded views can be found in chapter 10.

4.1.1 Manually opening the tray

- In case the loader is defective or cannot be opened electrically you can open the tray manually.
- Through a slot at the underside of the cabinet a slider that unlocks the tray can be accessed.
  However the slot is covered by an adhesive tape on the cabinet of the drive to prevent dust coming into the drive. Push through this adhesive tape by means of a thin screwdriver and move the slider to the left, see picture 4-1.
- **Make sure that an adhesive tape has been reapplied to the drive when repair is finished!**

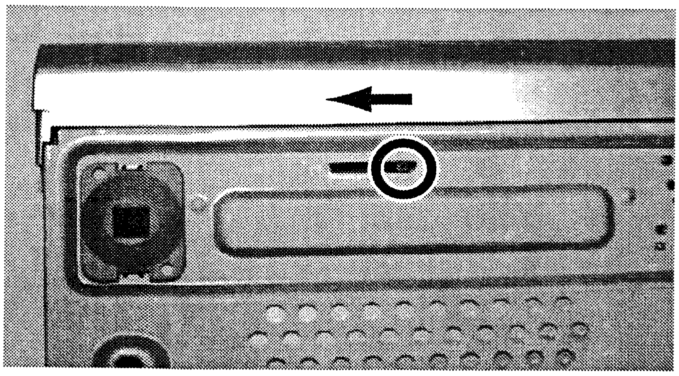


Figure 4-1

4.1.2 Front

- Before removing the front panel the tray has to be in the opened position.
- Remove the top cover
- Remove tray front by pulling it upwards (1), see picture 4-2
- Unplug the IDE cable that connects to the card reader (2), see picture 4-3
- Remove the 2 screws (3) that fix the card reader
- Remove the card reader PCB (4)
- Remove the screw (5) that fixes the bracket of the card reader to the front plate, see picture 4-4
- Remove the three screws (6) fixing the front panel
- Release the cables from the clamps (7)
- Release the two snap hooks at the sides (8) and remove the front (9), see picture 4-5
- Remove the 9 screws (10) to remove the front plate (11), see picture 4-6, 4-7

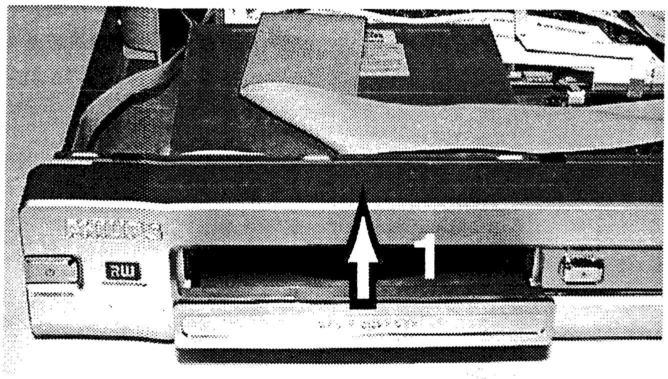


Figure 4-2

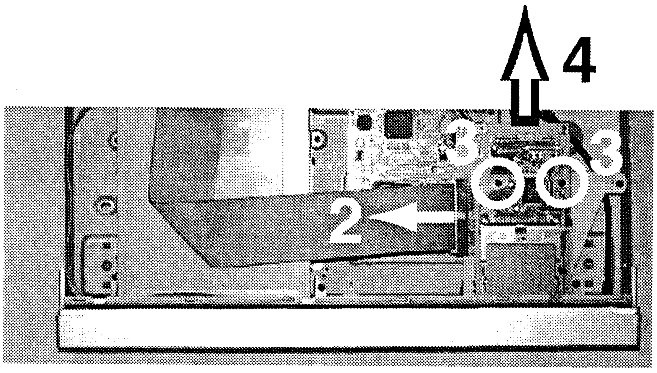


Figure 4-3

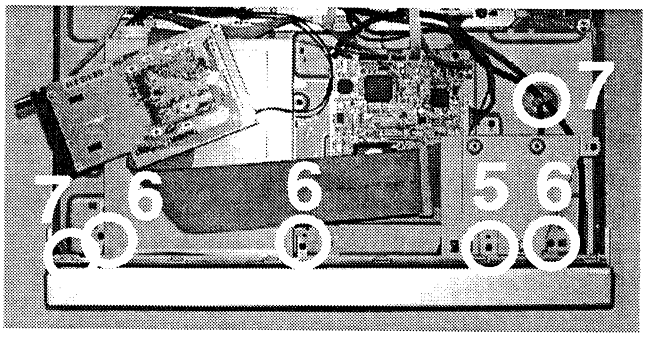


Figure 4-4

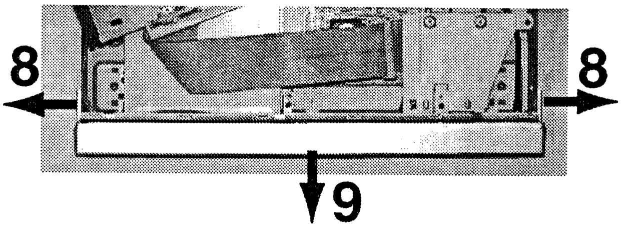


Figure 4-5

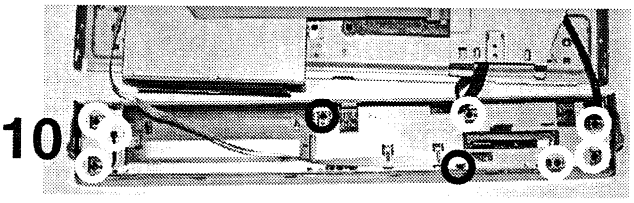


Figure 4-6

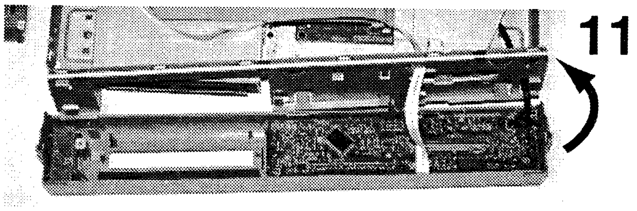


Figure 4-7

4.1.3 Digital Board

- Unplug the IDE cable that connects to the card reader (1), see picture 4-8
- Remove the 2 screws (2) that fix the card reader
- Remove the card reader PCB (3)
- Remove the 3 screws (4) that fix the bracket of the card reader, see picture 4-9.
- Remove the 4 screws (5) that fix the Digital Board, see picture 4-10, and turn the Digital Board to the required service position, see picture 4-11

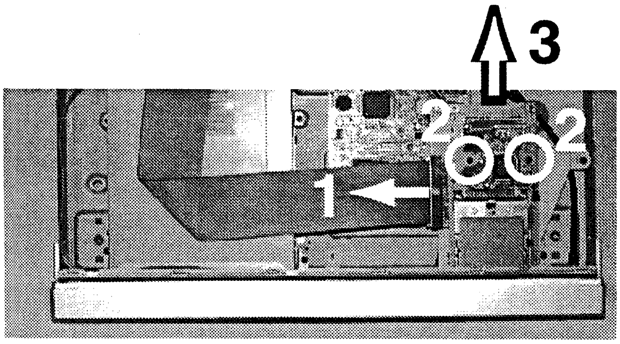


Figure 4-8

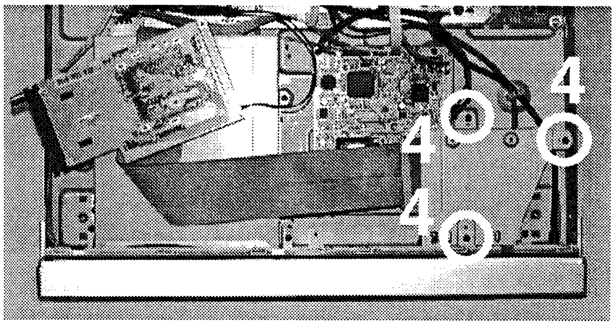


Figure 4-9

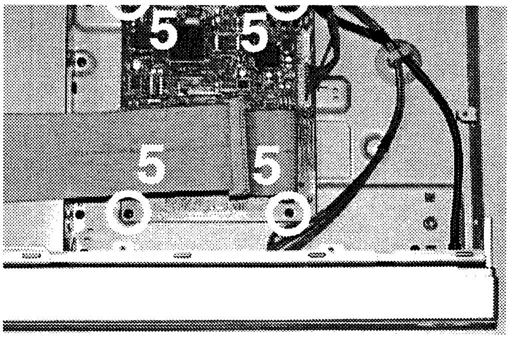


Figure 4-10

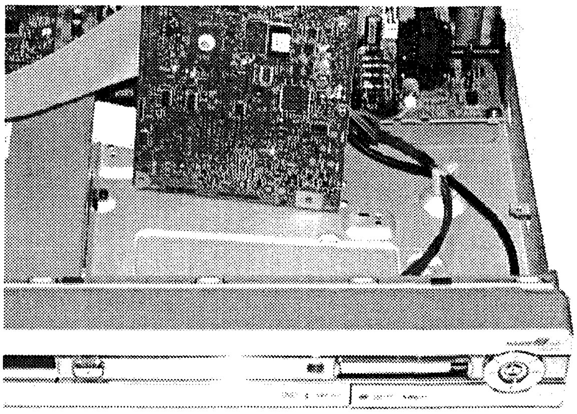


Figure 4-11

4.1.4 Basic Engine

- Remove the tray, see picture 4-2
- Remove the 4 screws that fix the drive, see picture 4-12

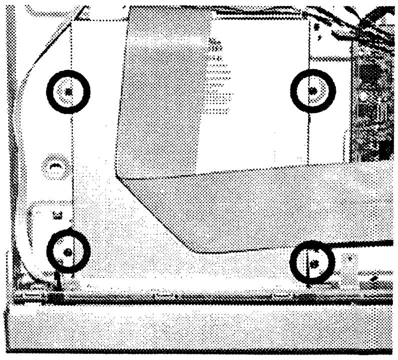


Figure 4-12

4.1.5 Analog Board

- Remove the 3 screws (1) that fix the back plate to the bottom plate, see picture 4-13
- Remove the 4 screws (2) that fix the Analog Board to the bottom plate
- Remove the Fan assy by releasing the fixing screw (3)
- Remove screw safety holder (4)
- Unlock the two snaps hooks at the left and right (5), see picture 4-14, and pull the board and backplate out gently (6)
- Turn the PCB in the service position (7), see picture 4-15

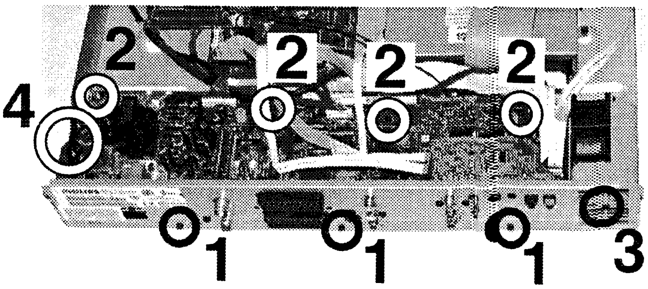


Figure 4-13

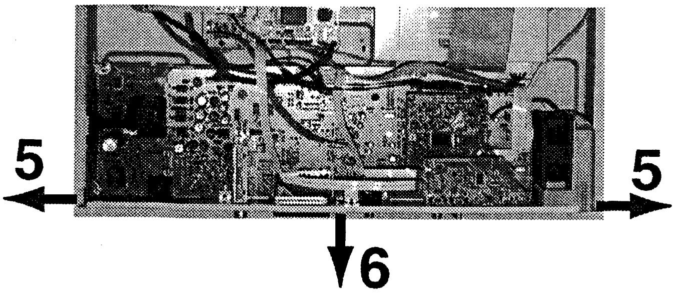


Figure 4-14

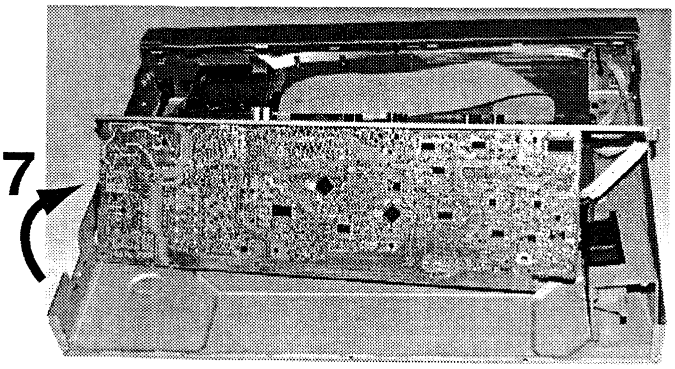


Figure 4-15

5. Diagnostic Software

Due to the complexity of the DVD recorder, the time to find a defect in the recorder can become long. To reduce this time, the recorder has been equipped with Diagnostic and Service software (DS). The DS offers functionality to diagnose the DVDR hardware and tests the following:

- Interconnections between components
- Accessibility of components
- Functionality of the audio and video paths

This functionality can be accessed via several interfaces:

1. End user/Dealer script interface
2. Command Interface

5.1 End User/Dealer Script Interface

5.1.1 Description

The End user/Dealer script interface gives a diagnosis on a stand alone DVD recorder. During this mode, a number of hardware tests (nuclei) are automatically executed to check if the recorder is faulty. The diagnosis is simply a "fail" or "pass" message. If the message "FAIL" appears on the display, there is apparently a failure in the recorder. If the message "PASS" appears, the nuclei in this mode have been executed successfully. There can be still a failure in the recorder because the nuclei in this mode don't cover the complete functionality of the recorder.

5.1.2 Structure

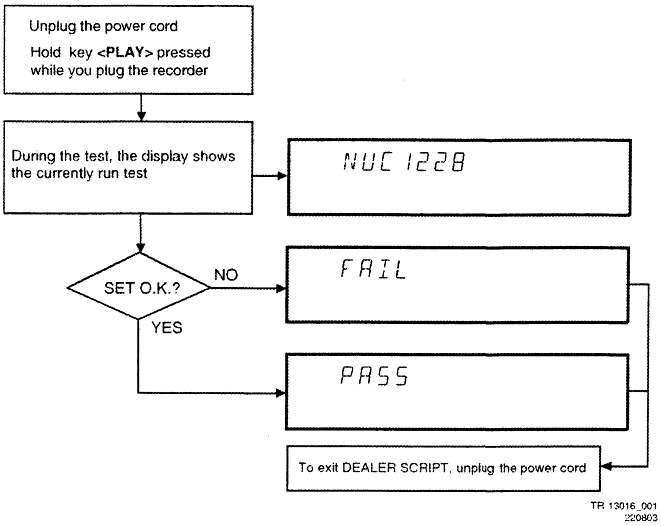

Unplug the power cord
Hold key <PLAY> pressed while you plug the recorder
During the test, the display shows the currently run test
NUC 1228
SET O.K.?
NO
YES
FAIL
PASS
To exit DEALER SCRIPT, unplug the power cord
TR 13016_001 220803

Figure 5-1

The End use/Dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD recorder.

5.1.3 Contents

Included tests:	1.DS_ANAB_COMMUNICATIONECHO_NUC 2.DS_DCB_COMMUNICATIONECHO_NUC 3. DS_BROM_COMMUNICATION_NUC 4. DS_SYS_SETTINGSDISPLAY_NUC 5. DS_CHR_DEVTYPEGET_NUC6. DS_CHR_INT_PIC_NUC7. DS_CHR_DMA_NUC8. DS_BROM_WRITEREAD_NUC9. DS_NVRAM_COMMUNICATION_NUC10. DS_NVRAM_WRITEREAD_NUC11. DS_SDRAM_WRITEREADFAST_NUC12. DS_FLASH_WRITEREAD_NUC13.DS_FLASH_CHECKSUMPROGRAM_NUC14.DS_SYS_HARDWAREVERSIONGET_NUC15. DS_VIP_DEVTYPEGET_NUC16. DS_VIP_COMMUNICATION_NUC17. DS_DVIO_LINKDEVTYPEGET_NUC18. DS_DVIO_PHYDEVTYPEGET_NUC19. DS_DVIO_LINKCOMMUNICATION_NUC20. DS_DVIO_PHYCOMMUNICATION_NUC21.DS_PSCAN_COMMUNICATIONDENC_NUC22.DS_PSCAN_COMMUNICATIONDEINTERLACER_NUC23. DS_BE_COMMUNICATIONECHO_NUC24.DS_ANAB_COMMUNICATIONIICNVRAM_NUC25.DS_ANAB_COMMUNICATIONIICTUNER_NUC26.DS_ANAB_COMMUNICATIONIICSOUNDPROCESSOR_NUC27.DS_ANAB_COMMUNICATIONIICAVSELECTOR_NUC28. DS_ANAB_CHECKSUMPROGRAM_NUC

5.2 Trade Mode

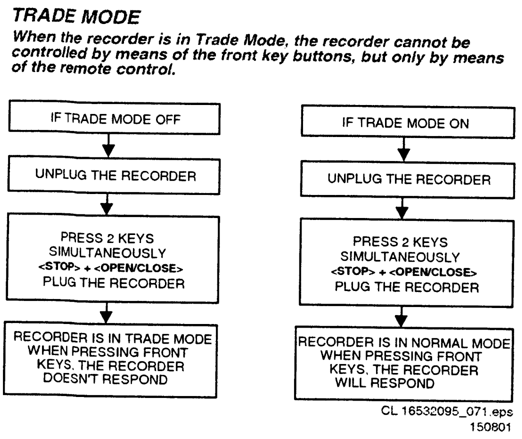

TRADE MODE
When the recorder is in Trade Mode, the recorder cannot be controlled by means of the front key buttons, but only by means of the remote control.
IF TRADE MODE OFF
UNPLUG THE RECORDER
PRESS 2 KEYS SIMULTANEOUSLY <STOP> + <OPEN/CLOSE> PLUG THE RECORDER
RECORDER IS IN TRADE MODE WHEN PRESSING FRONT KEYS. THE RECORDER DOESN'T RESPOND
IF TRADE MODE ON
UNPLUG THE RECORDER
PRESS 2 KEYS SIMULTANEOUSLY <STOP> + <OPEN/CLOSE> PLUG THE RECORDER
RECORDER IS IN NORMAL MODE WHEN PRESSING FRONT KEYS. THE RECORDER WILL RESPOND
CL 16532095_071.eps
150801

Figure 5-2

5.3 Virgin mode

If you want that the recorder starts up in Virgin mode, follow this procedure:

- Unplug the recorder
- plug the recorder again while you keep the STAND BY/ON key pressed
- the set starts up in Virgin mode.

5.4 Command Mode Interface

5.4.1 Nuclei Numeration

Each nucleus has a unique number of four digits. This number is the input of the command mode.

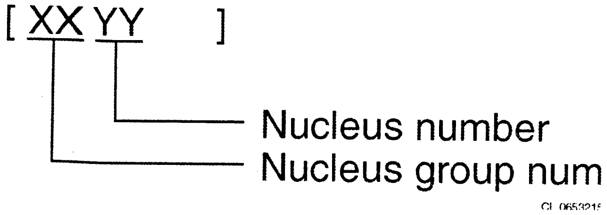

[XX YY]
Nucleus number
Nucleus group num

Figure 5-3

The following groups are defined for Digital Board Chrysalis:

Group number	Group name
0	Basic / Scripts
1	Chrysalis
2	Boot EEPROM
3	NVRAM
4	SDRAM
5	Flash
6	Video Input Processor
7	DVIO
8	Progressive Scan
9	Basic Engine
10	Display and Control Board
11	Analogue Board
12	System

5.4.2 Error Handling

Each nucleus returns an error code. This code contains six numerals, which means:

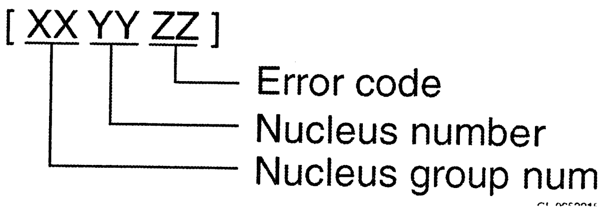

[XX YY ZZ]
Error code
Nucleus number
Nucleus group num

Figure 5-4

The nucleus group numbers and nucleus numbers are the same as above.

5.4.3 Command Mode Interface

Set-Up Physical Interface Components
Hardware required:

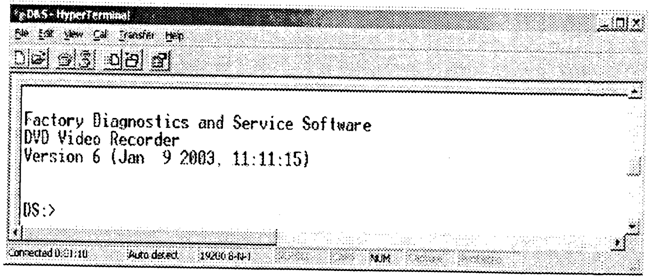
- Service PC
- one free COM port on the Service PC
- special cable to connect DVD recorder to Service PC

The service PC must have a terminal emulation program (e.g. Hyperterminal) installed and must have a free COM port (e.g. COM1). Activate the terminal emulation program and check that the port settings for the free COM port are: 19200 bps, 8 data bits, no parity, 1 stop bit and no flow control. The free COM port must be connected via a special cable to the RS232 port of the DVD recorder. This special cable will also connect the test pin, which is available on the connector, to ground (i.e. activate test pin).
Code number of PC interface cable: 3122 785 90017

Activation Digital Board Chrysalis

1. Pull the mains cord from the recorder and reconnect it again (reboot).
2. The next welcome message will appear on the PC:

Startup screen


DkS - HyperTerminal
File Edit View Call Transfer Help
Connected 0:01:10
Auto detect
19200 8-N-1
NUM

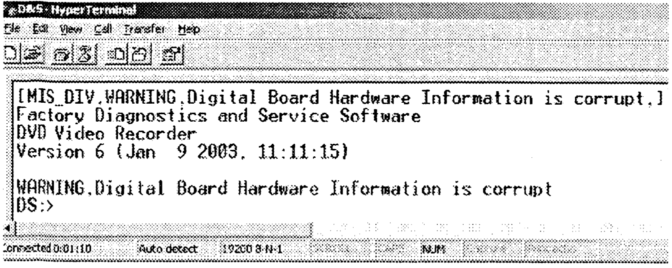
```
Factory Diagnostics and Service Software
DVD Video Recorder
Version 6 (Jan  9 2003, 11:11:15)

DS:>
```

Figure 5-5

Now, the prompt 'DS:>' will appear. The diagnostic software is now ready to receive commands. The commands that can be given are the numbers of the nuclei. If you see above shown screen, continue with paragraph 'Nuclei Codes'.

1. It is possible that the next messages will appear when starting the DVD+RW for the first time

Error messages startup

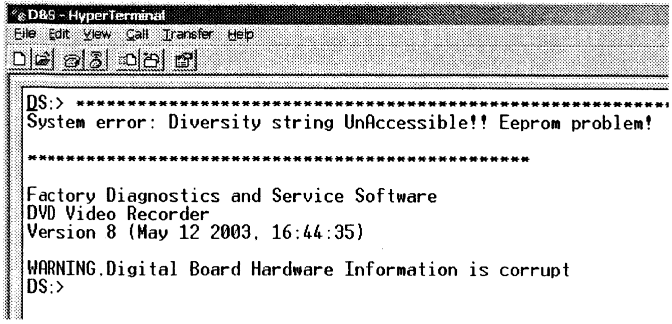


D&S - HyperTerminal
File Edit View Call Transfer Help
Connected 0:01:10 Auto detect 19200 8-N-1 NUM

```
[MIS_DIV.WARNING.Digital Board Hardware Information is corrupt.]
Factory Diagnostics and Service Software
DVD Video Recorder
Version 6 (Jan  9 2003, 11:11:15)

WARNING.Digital Board Hardware Information is corrupt
DS:>
```

Figure 5-6

Error messages D&S program



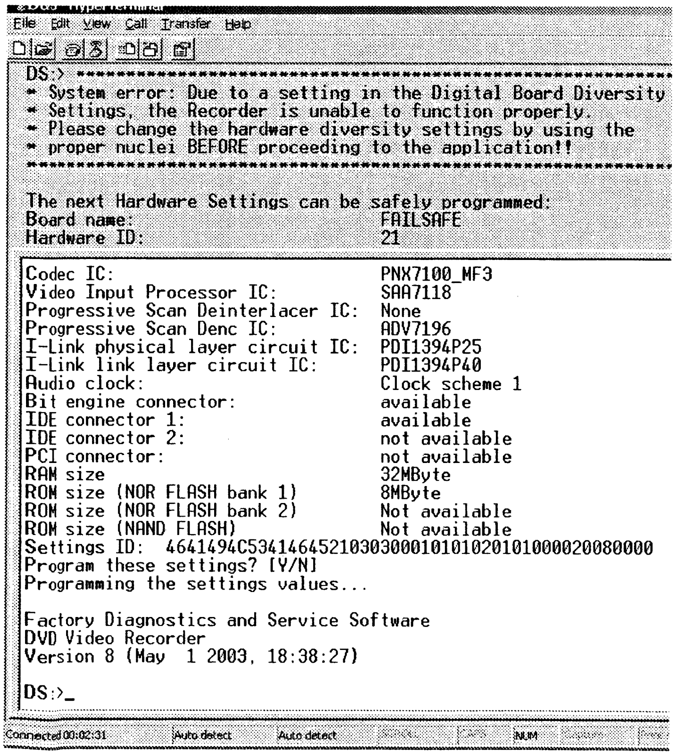
D&S - HyperTerminal
File Edit View Call Transfer Help

```
DS:> **************************************************************
System error: Diversity string UnAccessible!! Eeprom problem!

****************************************************

Factory Diagnostics and Service Software
DVD Video Recorder
Version 8 (May 12 2003, 16:44:35)

WARNING.Digital Board Hardware Information is corrupt
DS:>
```

Figure 5-7

In these cases, the boot EEPROM of the Chrysalis Digital Board does not contain the required string with the hardware information. To update the Digital Board with the correct string, nucleus 1226 must be executed. See next section 'Diversity String Input'.

There can also be the next error message.



File Edit View Call Transfer Help
Connected 00:02:31 Auto detect Auto detect NUM

```
DS:> ****************************************************************
 * System error: Due to a setting in the Digital Board Diversity
 * Settings, the Recorder is unable to function properly.
 * Please change the hardware diversity settings by using the
 * proper nuclei BEFORE proceeding to the application!!
 *****************************************************************

The next Hardware Settings can be safely programmed:
Board name:                          FAILSAFE
Hardware ID:                         21
Codec IC:                            PNX7100_MF3
Video Input Processor IC:            SAA7118
Progressive Scan Deinterlacer IC:    None
Progressive Scan Denc IC:            ADV7196
I-Link physical layer circuit IC:    PDI1394P25
I-Link link layer circuit IC:        PDI1394P40
Audio clock:                         Clock scheme 1
Bit engine connector:                available
IDE connector 1:                     available
IDE connector 2:                     not available
PCI connector:                       not available
RAM size                             32MByte
ROM size (NOR FLASH bank 1)          8MByte
ROM size (NOR FLASH bank 2)          Not available
ROM size (NAND FLASH)                Not available
Settings ID:  4641494C5341464521030300010101020101000020080000
Program these settings? [Y/N]
Programming the settings values...

Factory Diagnostics and Service Software
DVD Video Recorder
Version 8 (May  1 2003, 18:38:27)

DS:>_
```

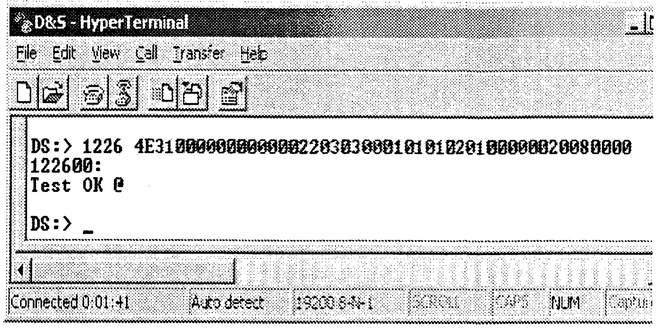
Figure 5-8

Enter "Y" to program a safe string. With this automatically generated string the board will work in principle but it has to be checked if all board settings were detected correctly.

Diversity String Input

1. Execute nucleus 1226 to enter the string. Please see adjustment instructions in chapter 8 for details

Nucleus 1226 execution with string



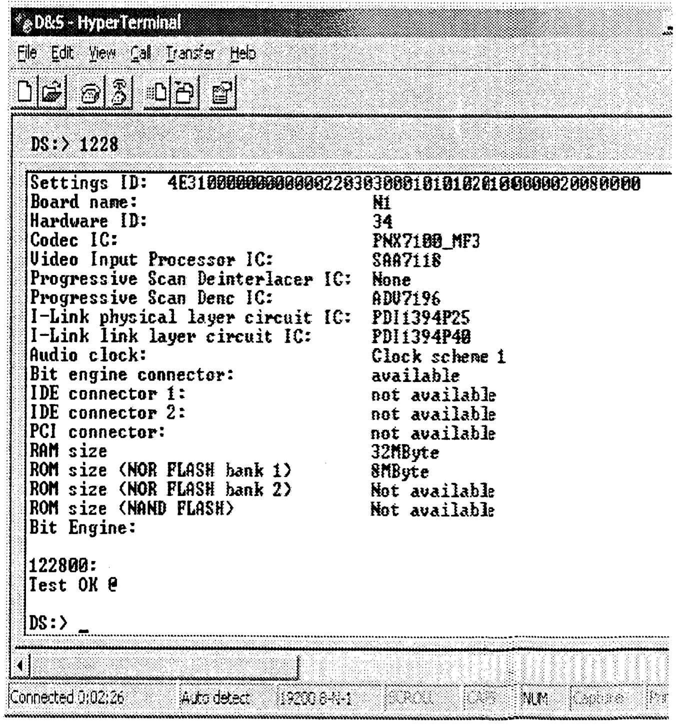
D&S - HyperTerminal
File Edit View Call Transfer Help
Connected 0:01:41 Auto detect 19200 8-N-1 SCROLL CAPS NUM Captu

```
DS:> 1226 4E3100000000000022030300010101020100000020080000
122600:
Test OK @

DS:> _
```

Figure 5-9

1. To check if the hardware info is filled correctly, you can execute nucleus 1228.

Nucleus 1228 info example



D&S - HyperTerminal
File Edit View Call Transfer Help
Connected 0:02:26 Auto detect 19200 8-N-1 SCROLL CAPS NUM Capture

```
DS:> 1228

Settings ID:  4E3100000000000022030300010101020100000020080000
Board name:                           N1
Hardware ID:                          34
Codec IC:                             PNX7100_MF3
Video Input Processor IC:             SAA7118
Progressive Scan Deinterlacer IC:     None
Progressive Scan Denc IC:             ADV7196
I-Link physical layer circuit IC:     PDI1394P25
I-Link link layer circuit IC:         PDI1394P40
Audio clock:                          Clock scheme 1
Bit engine connector:                 available
IDE connector 1:                      not available
IDE connector 2:                      not available
PCI connector:                        not available
RAM size                              32MByte
ROM size (NOR FLASH bank 1)           8MByte
ROM size (NOR FLASH bank 2)           Not available
ROM size (NAND FLASH)                 Not available
Bit Engine:

122800:
Test OK @

DS:> _
```

Figure 5-10

1. Exit the 'Terminal' program.
1. Reboot the DVD recorder to allow the software to start.

Command overview Digital Board Chrysalis

Below you will find an overview of the nuclei, their numbers, and their error codes. This overview is preliminary and subject to modifications.

Chrysalis (CHR)

Nucleus Name	**DS_CHR_DevTypeGet**
Nucleus Number	100
Description	Sends the device ID and the module ids and revisions of the PNX7100 (Chrysalis) to the stdout port.
User Input	None
Example	

```
DS:> 100
Device ID  7100
Codec ID   PNX7100_MF2
F-BCU  (0x0102) 1.0 INTC  (0x011d) 1.0 PCI-XIO(0x0113) 1.0
SIF(0x013b) 1.0 EJTAG  (0x0104) 0.0   S-BCU  (0x0102) 1.0
BOOT (0x010a) 1.0 CONFIG (0x013f) 1.0 RESET  (0x0123) 1.0
DEBUG  (0x0116) 0.0   UART0  (0x0107) 0.1   UART1  (0x0107) 0.1
UART2  (0x0107) 0.1   UART3  (0x0107) 0.1   I2C0   (0x0105) 0.1
I2C1   (0x0105) 0.1   GPIO   (0x013c) 1.0   SYNC   (0x013a) 1.0
DISP0  (0xa015) 0.1   DISP1  (0xa00f) 0.0   OSD    (0x0136) 0.1
SPU    (0xa00e) 0.0   MIXER  (0x0137) 1.0   DENC   (0x0138) 0.1
CCIR   (0x0139) 1.0   VDEC   (0x0133) 0.1   PARSER (0xa00d) 0.0
DV     (0xa00c) 0.0   BEI    (0xa00a) 0.0   IDE    (0xa009) 0.0
SGDX   (0xa008)0.0 BYTE  (0xa00b) 0.0   OUTPUT (0xa003) 0.0
ACOMP  (0xa000) 0.0   VFE    (0xa001) 0.0   VCOMP  (0xa002) 0.0
SCR    (0x0000) 0.0 SIFF  (0xa011) 0.0 WMD   (0xa010) 0.0
AUDIO0 (0xa015) 0.1 AUDIO1 (0xa00f) 0.0 PSCAN  (0xa018) 0.0

010000:
Test OK @
```

Nucleus Name	**DS_CHR_TestImageOn**
Nucleus Number	101
Description	Generates a test-image of a selected video standard on selected video output on the digital board. When no input is given, the default values will be used. Use nucleus **DS_ANAB_VideoRouting** to route the video signal on the analogue board output
User Input	The user has to decide which test image, video standard and video output must be used: **Test image id:** 0 VERTICAL_COLOURBAR (default) 1 HORIZONTAL_COLOURBAR 2 WHITE 3 YELLOW 4 CYAN 5 GREEN 6 MAGENTA 7 RED 8 BLUE 9 BLACK 10 GRAY **Video standard:** PAL (default) NTSC **Video output:** ALL CVBS and YC and RGB (default) CVBS YC RGB YUV PSCAN progressive scan
Example	

```
DS:> 101
010100:
Test OK @
DS:> 101 0 pal cvbs
010100:
Test OK @
DS:> 101 4 ntsc yc
010100:
Test OK @
```

Nucleus Name	**DS_CHR_TestImageOff**
Nucleus Number	102
Description	Switches the test-image off.
User Input	None

Example	DS:> 102 010200: Test OK @

Nucleus Name	**DS_CHR_SineOn**
Nucleus Number	103
Description	Generate an audio sine signal on the audio output of the digital board. Note: Left channel 6kHz, right channel 12 kHz sine. Make sure to route the signal first.
User Input	None
Example	DS:> 103 010300: Test OK @

Nucleus Name	**DS_CHR_SineOff**
Nucleus Number	104
Description	Stop generating the audio sine signal
User Input	None
Example	DS:> 104 010400: Test OK @

Nucleus Name	**DS_CHR_SineBurst**
Nucleus Number	105
Description	Generate an audio sine signal on the audio output of the digital board for 4 seconds.
	Note: Left channel 6kHz, right channel 12 kHz sine with some known hick-ups
User Input	None
Example	DS:> 105 010500: Test OK @

Nucleus Name	**DS_CHR_MuteOn**
Nucleus Number	106
Description	Mute the audio outputs of the digital board
User Input	None
Example	DS:> 106 010600: Test OK @

Nucleus Name	**DS_CHR_MuteOff**
Nucleus Number	107
Description	De-mute the audio outputs of the digital board
User Input	None
Example	DS:> 107 010700: Test OK @

Nucleus Name	**DS_CHR_DvLedOn**
Nucleus Number	108
Description	Check the connection to the DV-LED on the digital board by switching it on
User Input	None
Example	DS:> 108 010800: Test OK @

Nucleus Name	**DS_CHR_DvLedOff**
Nucleus Number	109
Description	Switch off the DV-LED on the digital board
User Input	None
Example	DS:> 109 010900: Test OK @

Nucleus Name	**DS_CHR_MacroVisionOn**
Nucleus Number	110
Description	Turn on MacroVision.
User Input	None
Example	DS:> 110 011000: Test OK @

Nucleus Name	**DS_CHR_MacroVisionOff**
Nucleus Number	111
Description	Turn off MacroVision.
User Input	None
Example	DS:> 111 011100: Test OK @

Nucleus Name	**DS_CHR_Peek**
Nucleus Number	112
Description	Peek a value on a specified address
User Input	The address to peek on
Example	DS:> 112 0xa0700000 011200: Value read = 0x000001BD Test OK @

Nucleus Name	**DS_CHR_Poke**
Nucleus Number	113
Description	Poke a value on a specified address
User Input	The address to poke and the value: <address><value>
Example	DS:> 113 0xa0700000 0xaabbccdd 011300: Test OK @

Nucleus Name	**DS_CHR_INT_PICInterrupts**
Nucleus Number	114
Description	Test all interrupts of the priority interrupt controller
User Input	-
Example	DS:> 114 011400: Test OK @

Nucleus Name	**DS_CHR_DMA_TestDMA**
Nucleus Number	115
Description	Test the memory to memory DMA transfer
User Input	-
Example	DS:> 115 011500: Test OK @

Boot EEPROM (BROM)

Nucleus Name	**DS_BROM_Communication**
Nucleus Number	200
Description	Check the communication between the IIC controller of the Chrysalis and the boot EEPROM
User Input	None
Example	DS:> 200 020000: Test OK @

Nucleus Name	**DS_BROM_WriteRead**
Nucleus Number	201
Description	Check whether the Boot EEPROM can be written to and read from
User Input	None

Example	DS:> 201 020100: Test OK @

NVRAM

Nucleus Name	**DS_NVRAM_Communication**
Nucleus Number	300
Description	Check the communication between the IIC controller of the Chrysalis and the EEPROM
User Input	None
Example	DS:> 300 030000: Test OK @

Nucleus Name	**DS_NVRAM_WriteRead**
Nucleus Number	301
Description	Check whether the EEPROM can be written to and read from
User Input	None
Example	DS:> 301 030100: Test OK @

Nucleus Name	**DS_NVRAM_Clear**
Nucleus Number	302
Description	Make the EEPROM empty, containing all zeroes.
User Input	None
Example	DS:> 302 030200: Test OK @

Nucleus Name	**DS_NVRAM_Modify**
Nucleus Number	303
Description	Modifies one or more locations in NVRAM and updates the checksum of the section modified
User Input	1. The location that must be modified i.e. "ALL" "BOOT" "DIAGNOSTICS" "DOWNLOAD" "CONFIG" "RECORDER" or no string if an offset from the base address of the NVRAM is required 2. The offset and data which to put on the selected location <offset> <length> <data>
Example	DS:> 303 DIAGNOSTICS 5 1 0x5a 030300:Section is modified successfully Test OK @

Nucleus Name	**DS_NVRAM_Read**
Nucleus Number	304
Description	Read out one or more locations in the NVRAM
User Input	1. The location which must be read i.e. "ALL" "BOOT" "DIAGNOSTICS" "DOWN LOAD" "CONFIG" "RECORDER" or no string if an offset from the base address of the NVRAM is required 2. The offset and number of bytes to read <offset> <length>
Example	304 DIAGNOSTICS 0 6 030400: Value read = 0x00 0x00 0x00 0x00 0x00 0x5A Test OK @

SDRAM

Nucleus Name	**DS_SDRAM_WriteRead**
Nucleus Number	400
Description	Check all data lines, address lines and memory locations of the SDRAM
User Input	None
Example	DS:> 400 040000: Test OK @

Nucleus Name	**DS_SDRAM_WriteReadFast**
Nucleus Number	401

Description	Check all data lines and address lines of the SDRAM
User Input	None
Example	DS:> 401 040100: Test OK @

Nucleus Name	**DS_SDRAM_Write**
Nucleus Number	402
Description	Write to a specific memory address
User Input	1. The location that must be modified (SDRAM starts at address 0xA0000000) 2. The value to put on the selected location
Example	DS:> 402 0xa1000010 0xad112222 040200: Test OK @

Nucleus Name	**DS_SDRAM_Read**
Nucleus Number	403
Description	Read from a specific memory address
User Input	The location from which the data must be read (SDRAM starts at address 0xA0000000)
Example	DS:> 403 0xa1000010 040300: Value read = 0xAD112222 Test OK @

FLASH

Nucleus Name	**DS_FLASH_DevTypeGet**
Nucleus Number	500
Description	Get the device (revision) type information of the FLASH IC. (manufacturer and device ID)
User Input	None
Example	DS:> 500 050000: Found FLASH memory: Manufacturer ID: 0x01 Device ID : 0x01 Test OK @

Nucleus Name	**DS_FLASH_WriteRead**
Nucleus Number	501
Description	Check whether the FLASH can be written to and read from
User Input	None
Example	DS:> 501 050100: Test OK @

Nucleus Name	**DS_FLASH_Read**
Nucleus Number	502
Description	Read from a specific memory address in FLASH
User Input	The location from which data must be read (FLASH starts at address 0xB8000000)
Example	DS:> 502 0xb8000000 050200: Value read = 0x3C08A000 Test OK @

Nucleus Name	**DS_FLASH_ChecksumProgram**
Nucleus Number	503
Description	Check the checksum of the application partitions by recalculating and comparing partition checksums
User Input	None
Example	DS:> 503 050300: BootCode checksum is: 0xBABE5B6F, which is correct Diagnostics checksum is : 0xBABEBAFF, which is correct Download checksum is: 0xBABEEDBF, which is correct Application checksum is : 0xBABE8EEC, which is correct Test OK @

Nucleus Name	**DS_FLASH_CalculateChecksum**
Nucleus Number	504
Description	Calculate the checksum over all memory addresses. Used to check entire FLASH contents
User Input	None
Example	DS:> 504 050400: The Checksum = 0xBABE30A4 Test OK @

Nucleus Name	**DS_FLASH_CalculateChecksumFast**
Nucleus Number	505
Description	Calculate a checksum over a selected number of address locations
User Input	None
Example	DS:> 505 050500: The Checksum = 0xBABEB064 Test OK @

Video Input Processor (VIP)

Nucleus Name	**DS_VIP_DevTypeGet**
Nucleus Number	600
Description	Get the device (revision) type information of the VIP IC
User Input	None
Example	DS:> 600 060000: Found SAA7118 Test OK @

Nucleus Name	**DS_VIP_Communication**
Nucleus Number	601
Description	Check the communication between the IIC controller of the chrysalis and the VIP IC
User Input	None
Example	DS:> 601 060100: Test OK @

Nucleus Name	**DS_VIP_ClockOutputOn**
Nucleus Number	602
Description	Switch the clock output on
User Input	None
Example	DS:> 602 060200: Test OK @

Nucleus Name	**DS_VIP_ClockOutputOff**
Nucleus Number	603
Description	Switch the clock output off
User Input	None
Example	DS:> 603 060300: Test OK @

Nucleus Name	**DS_VIP_SelectInput**
Nucleus Number	604
Description	Select an input video path to be switched to the analogue output pin (AOUT) of the VIP
User Input	The input to select, see table below. 1 CVBS_Y_IN_A 2 CVBS_OUT_B 3 CVBS_Y_IN_B 4 CVBS_Y_IN_C 6 C_IN 8 G_IN 9 Y_IN 13 B_IN 14 U_IN 18 R_IN 19 V_IN

Example	DS:> 604 1 060400: Test OK @

Digital Video Input Output (DVIO)

Nucleus Name	**DS_DVIO_LinkDevTypeGet**
Nucleus Number	700
Description	Get the device (revision) type information of the 1394 Link layer IC
User Input	None
Example	DS:> 700 070000: Device type of the link layer IC: ffc00301 Test OK @

Nucleus Name	**DS_DVIO_PhyDevTypeGet**
Nucleus Number	701
Description	Get the device (revision) type information of the 1394 Physical layer IC
User Input	None
Example	DS:> 701 070100: Device type of the phy layer IC: 0 Test OK @

Nucleus Name	**DS_DVIO_LinkCommunication**
Nucleus Number	702
Description	Check the accessibility of the 1394 Link layer IC by writing to and reading from a specific address
User Input	None
Example	DS:> 702 070200: Test OK @

Nucleus Name	**DS_DVIO_PhyCommunication**
Nucleus Number	703
Description	Check the accessibility of the 1394 Physical layer IC by writing to and reading from a specific address
User Input	None
Example	DS:> 703 070300: Test OK @

Nucleus Name	**DS_DVIO_Routing**
Nucleus Number	704
Description	Route a DV stream containing an audio and video signal through the physical and link layer ICs to the Chrysalis
User Input	None, test works for both NTSC and PAL
Example	DS:> 704 070400: Test OK @

Nucleus Name	**DS_DVIO_DetectNode**
Nucleus Number	705
Description	Check whether a DV node can be detected by the hardware
User Input	None, test works for both NTSC and PAL
Example	DS:> 705 070500: Test OK @

Nucleus Name	**DS_DVIO_DetectStream**
Nucleus Number	706
Description	Check whether a DV stream can be detected by the hardware
User Input	None, test works for both NTSC and PAL
Example	DS:> 706 070600: Test OK @

Progressive Scan (PSCAN)

Nucleus Name	**DS_PSCAN_CommunicationDenc**
Nucleus Number	801
Description	Check the communication between the IIC controller of the chrysalis and the progressive scan DENC-IC
User Input	None
Example	DS:> 801 080100: Test OK @

Nucleus Name	**DS_PSCAN_TestImageOn**
Nucleus Number	802
Description	Generate the test images that are present on the progressive scan IC.
User Input	In case of ADV7196: When no input is given “HATCH” is the default -“HATCH” -“FRAME” Remark: “HATCH” is a crosshatch test pattern (horizontal and vertical white lines are displayed against a black background) “FRAME” is a uniform coloured frame/field test pattern (default white). In case of FLI2300: Nothing.
Example	DS:> 802 HATCH 080200: Test OK @

Nucleus Name	**DS_PSCAN_TestImageOff**
Nucleus Number	803
Description	Switch off the generated test image
User Input	None
Example	DS:> 803 080300: Test OK @

Nucleus Name	**DS_PSCAN_TestImageColourSettingsSet**
Nucleus Number	804
Description	Set the colour of the hatch- or the frame- field to a different value than the default white
User Input	A colour string of one of the next non-case sensitive strings (WHITE, BLACK, RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA) or Y Cr Cb (hexa-) decimal values.
Example	DS:> 804 yellow 080400: Test OK @ DS:> 804 0x6a 0xde 0xca 080400: Test OK @

Nucleus Name	**DS_PSCAN_TestImageColourSettingsGet**
Nucleus Number	805
Description	Get the colour settings of the hatch- or the frame- field.
User Input	None
Example	DS:> 805 080500: Colour Y Cr Cb values: 0xD2 0x92 0x10 Test OK @

Nucleus Name	**DS_PSCAN_Routing**
Nucleus Number	806
Description	Route a video signal from the host processor through the progressive scan ICs to the progressive scan output of the set. Note: to route the progressive scan to the output of the set, first call nucleus 1112 with parameter 0 (video routing on analogue board).
User Input	None
Example	DS:> 806 080600: Test OK @

Nucleus Name	**DS_PSCAN_DevTypeGetDeinterlacer**
Nucleus Number	807
Description	Get the device (revision) type information of the progressive scan deinterlacer.
User Input	None
Example	DS:> 807 080700: Chip name : 2300 Chip version : 1 Test OK @

Nucleus Name	**DS_PSCAN_CommunicationDeinterlacer**
Nucleus Number	808
Description	Check the communication between the IIC controller of the chrysalis and the progressive scan Deinterlacer-IC
User Input	None
Example	DS:> 808 080800: Test OK @

Basic Engine (BE)

Nucleus Name	**DS_BE_CommunicationEcho**
Nucleus Number	900
Description	Check the communication between the digital board and the basic engine by issuing an echo command over the S2B interface
User Input	None
Example	DS:> 900 090000: Test OK @

Nucleus Name	**DS_BE_Reset**
Nucleus Number	901
Description	Reset the basic engine
User Input	None
Example	DS:> 901 090100: Test OK @

Nucleus Name	**DS_BE_VersionGet**
Nucleus Number	903
Description	Get the version of the basic engine and that of the optical unit
User Input	None
Example	DS:> 903 090300: BE version = 20.09.18 Optical unit version = 3C.00.09.41.08 Test OK @

Nucleus Name	**DS_BE_GetSelftestResult**
Nucleus Number	902
Description	Return the self-test results through the service port
User Input	None
Example	DS:> 902 090200: Test OK @

Nucleus Name	**DS_BE_TrayOut**
Nucleus Number	904
Description	Open the tray of the basic engine
User Input	None
Example	DS:> 904 090400: Test OK @

Nucleus Name	**DS_BE_TrayIn**
Nucleus Number	905
Description	Close the tray of the basic engine

User Input	None
Example	DS:> 905 090500: Test OK @

Nucleus Name	**DS_BE_WriteReadDvdRw**
Nucleus Number	906
Description	Write data to and read data from a DVD+RW disc through the basic engine for verification of the writing
User Input	None
Example	DS:> 906 090600: Testing on sector 0x5dbe0: OK Test OK @

Nucleus Name	**DS_BE_WriteReadDvdR**
Nucleus Number	907
Description	Write data to and read data from a DVD+R disc through the basic engine for verification of the writing
User Input	None
Example	DS:> 907 090700: Testing on sector 0x36210: OK Test OK @

Nucleus Name	**DS_BE_StatisticalInformationGet**
Nucleus Number	908
Description	Retrieve the statistical information from the basic engine
User Input	None
Example	DS:> 908 Total time the power power on (HR:MIN) 0: 0h Total time of reading CDROM discs (HR:MIN) 0: 0h Total time of reading high DVD SL discs (HR:MIN) 0: 0h Total time of reading other DVD SL discs (HR:MIN) 0: 0h Total time of reading high DVD DL siscs (HR:MIN) 0: 0h Total time of reading other DVD DL discs (HR:MIN) 0: 0h Total time of reading high DVD+R discs (HR:MIN) 0: 0h Total time of reading other DVD+R discs (HR:MIN) 0: 0h Total time of reading high DVD+RW discs (HR:MIN) 0: 0h Total time of reading other DVD+RW discs (HR:MIN) 1: 0h Total time of writing DVD+R discs in 2HRS mode (HR:MIN) 0: 0h Total time of writing DVD+R discs in 4HRS mode (HR:MIN) 0: 0h Total time of writing DVD+R discs in 6HRS mode (HR:MIN) 0: 2h Total time of writing DVD+RW discs in 2HRS mode (HR:MIN) 0: 0h Total time of writing DVD+RW discs in 4HRS mode (HR:MIN) 0: 3h Total time of writing DVD+RW discs in 6HRS mode (HR:MIN) 0: 0h 090800: Test OK @

Nucleus Name	**DS_BE_StatisticalInformationReSet**
Nucleus Number	909
Description	Reset the statistical information in the basic engine
User Input	None
Example	DS:> 909 090900: Test OK @

Nucleus Name	**DS_BE_ErrorLogGet**
Nucleus Number	910
Description	Get the error log from the basic engine
User Input	None
Example	DS:> 910 Momentary errors (0-9): 0x21 0x00 0x00 0x20 0x00 0x00 0x00 0x00 0x00 0x00 Cumulative errors (1-9): 0x00 0x80 0x20 0x00 0x00 0x00 0x00 0x00 0x00 Software fatal assert : 256 cpowermanager.cpp 091000: Test OK @

Nucleus Name	**DS_BE_ErrorLogReset**
Nucleus Number	911
Description	Reset the error log in the basic engine
User Input	None
Example	DS:> 911 091100: Test OK @

Nucleus Name	DS_BE_JitterOptimise
Nucleus Number	912
Description	Perform jitter optimisation:A formatted DVD must be loaded into the engine before executing this nucleus
User Input	none
Example	DS:> 912 Test OK @

Nucleus Name	**DS_BE_FocusOn**
Nucleus Number	913
Description	Put the laser of the BE into focus
User Input	None
Example	DS:> 913 091300: Test OK @

Nucleus Name	**DS_BE_FocusOff**
Nucleus Number	914
Description	Turn off putting the laser of the BE into focus
User Input	None
Example	DS:> 914 091400: Test OK @

Nucleus Name	**DS_BE_MotorOn**
Nucleus Number	915
Description	Turn on the turntable motor
User Input	None
Example	DS:> 915 091500: Test OK @

Nucleus Name	**DS_BE_MotorOff**
Nucleus Number	916
Description	Turn off the turntable motor
User Input	None
Example	DS:> 916 091600: Test OK @

Nucleus Name	**DS_BE_RadialOn**
Nucleus Number	917
Description	Close the radial loop
User Input	A formatted DVD must be loaded into the engine before executing this nucleus
Example	DS:> 917 091700: Test OK @

Nucleus Name	**DS_BE_RadialOff**
Nucleus Number	918
Description	Open the radial loop
User Input	None
Example	DS:> 918 091800: Test OK @

Nucleus Name	**DS_BE_RadialCalibration**
Nucleus Number	919
Description	Calibrate the radial loop
User Input	A formatted DVD must be loaded into the engine before executing this nucleus
Example	DS:> 919 091900: Test OK @

Nucleus Name	**DS_BE_Tilt**
Nucleus Number	920
Description	Test the tilt mechanism control loop, or allow its proper functioning to be measured.Before executing this nucleus a disc must be loaded into the recorder
User Input	None
Example	DS:> 920 092000: Tilt sensor bathtub: (71,-12,145)(68,-12,135)(62,-10,120)(56,-92,97)(50,-75,86) (44,-59,80)(41,-52,80)(35,-37,86)(29,-22,86) (23,-7,92)(17,8,111)(11,23,135)(8,31,138)(5,39,158) Test OK @

Nucleus Name	**DS_BE_CheckDisc**
Nucleus Number	921
Description	Check whether there is a disc inside the BE
User Input	None
Example	DS:> 921 092100: A DVD+Rewritable is loaded (disc is empty or partially recorded) Test OK @ DS:> 921 092100: No Disc is loaded Test OK @

Nucleus Name	**DS_BE_SledgeMotor**
Nucleus Number	922
Description	Send the sledge to its home position, then to the middle of the disc, and then to the end.
User Input	None
Example	DS:> 922 092200: Test OK @

Nucleus Name	**DS_BE_ReadTocInfo**
Nucleus Number	924
Description	Read the TOC from the disc. This gives a good indication if the BE works properly..
User Input	None
Example	DS:> 924 092400: TOC info [hex] = 91 3A 0C Test OK@ DS:> 924 092403: The BE returned: 0x10 #{no_disc_error} No disc is detected Error@ DS:> 924 092403: The BE returned: 0x1e #{illegal_medium_error} Engine unable to handle current disc. Probably illegal medium. Error @

Nucleus Name	**DS_BE_DiscErase**
Nucleus Number	925
Description	Perform a DC-erase on a DVD+RW disc.
User Input	None

Example	DS:> 925 The entirely disc will be erased. Are you sure you want this?[y/n] 092500: Test OK @

Nucleus Name	**DS_BE_RegionCodeSet**
Nucleus Number	928
Description	Set the region code in the AV3.
User Input	Region code
Example	DS:> 928 1 092800: Test OK @ DS:> 928 This nucleus is not supported by the engine 092800: Test OK @

Nucleus Name	**DS_BE_RegionCodeGet**
Nucleus Number	929
Description	Read the region code from the AV3.
User Input	None
Example	DS:> 929 092900: DVD region 1 Test OK @ DS:> 929This nucleus is not supported by the engine 092900: Test OK @

Nucleus Name	**DS_BE_RegionCounterReset**
Nucleus Number	930
Description	Reset the region counter in the AV3.
User Input	None
Example	DS:> 930 093000: Test OK @ DS:> 930 This nucleus is not supported by the engine 093000: Test OK @

Nucleus Name	**DS_BE_AdjustLaserControl**
Nucleus Number	931
Description	Adjust the DVD-M (with the OPU) with PCBA. (So adjusts the two PCBS to each other)
User Input	None
Execution Time	30 seconds
Example	DS:> 931 093100: Test OK @

Display and Control Board (DCB)

Nucleus Name	**DS_DCB_CommunicationEcho**
Nucleus Number	1000
Description	Check the communication between the digital board and the DCB by issuing an echo command
User Input	None
Example	DS:> 1000 100000: Test OK @

Nucleus Name	**DS_DCB_VersionGet**
Nucleus Number	1001
Description	Get the version of the DCB

User Input	None
Example	DS:> 1001100100: DCB version: 13Test OK @

Nucleus Name	**DS_DCB_LightDisplay**
Nucleus Number	1002
Description	Light the entire display of the DCB, and clear the display after confirmation.User confirmation is necessary.
User Input	None
Example	DS:> 1002 100200: Test OK @

Nucleus Name	**DS_DCB_Keyboard**
Nucleus Number	1004
Description	Check all keys of the keyboard by confirming the key-code displayed of each key.
User Input	None
Example	DS:> 1004 100400: Test OK @

Nucleus Name	**DS_DCB_RemoteControl**
Nucleus Number	1005
Description	Check the interface between the remote control and the DCB by checking the key-code displayed
User Input	None
Example	DS:> 1005 100500: Test OK @

Nucleus Name	**DS_DCB_Led**
Nucleus Number	1006
Description	Switch the record LED on, and after confirmation off. The user confirms by pressing the REC key, STOP key, or the PLAY key on the local keyboard. The PLAY key confirms that the LED is on and the REC key
User Input	None
Example	DS:> 1006 100600: Test OK @

Analogue Board (ANAB)

Nucleus Name	**DS_ANAB_CommunicationEcho**
Nucleus Number	1100
Description	Check the communication between the digital board and the analogue board by issuing some echo string.
User Input	None
Example	DS:> 1100 110000: Hello Analogue Board Test OK @

Nucleus Name	**DS_ANAB_CommunicationIicNvram**
Nucleus Number	1101
Description	Check the communication between the digital board and the NVRAM on the analogue board.
User Input	None
Example	DS:> 1101 110100: Test OK @

Nucleus Name	**DS_ANAB_CommunicationIicTuner**
Nucleus Number	1102
Description	Check the communication between the digital board and the tuner on the analogue board
User Input	None

Example	DS:> 1102 110200: Test OK @

Nucleus Name	**DS_ANAB_CommunicationIicDataSlicer**
Nucleus Number	1103
Description	Check the communication between the digital board and the data slicer on the analogue board
User Input	None
Example	DS:> 1103 110300: Test OK @

Nucleus Name	**DS_ANAB_CommunicationIicSoundProcessor**
Nucleus Number	1104
Description	Check the communication between the digital board and the sound processor on the analogue board
User Input	None
Example	DS:> 1104 110400: Test OK @

Nucleus Name	**DS_ANAB_CommunicationIicAVSelector**
Nucleus Number	1105
Description	Check the communication between the digital board and the A/V-selector on the analogue board
User Input	None
Example	DS:> 1105 110500: Test OK @

Nucleus Name	**DS_ANAB_HardwareVersionGet**
Nucleus Number	1106
Description	Get the hardware version of the analogue board
User Input	None
Example	DS:> 1106 110600: Analogue hardware version : 11 Test OK @

Nucleus Name	**DS_ANAB_SoftwareVersionBootGet**
Nucleus Number	1107
Description	Get the software version of the boot software of the analogue board
User Input	None
Example	DS:> 1107 110700: Bootcode application version : 11.00.11 Test OK @

Nucleus Name	**DS_ANAB_SoftwareVersionDownloadGet**
Nucleus Number	1108
Description	Get the software version of the download software of the analogue board
User Input	None
Example	DS:> 1108 110800: Download application version : 11.00.06 Test OK @

Nucleus Name	**DS_ANAB_SoftwareVersionApplGet**
Nucleus Number	1109
Description	Get the software version of the application software of the analogue board
User Input	None
Example	DS:> 1109 110900: Recorder application version : 11.00.23 Test OK @

Nucleus Name	**DS_ANAB_SoftwareVersionDiagnosticsGet**
Nucleus Number	1110
Description	Get the software version of the diagnostic software of the analogue board
User Input	None
Example	DS:> 1110 111000: Diagnostics application version : 11.00.13 Test OK @

Nucleus Name	**DS_ANAB_ChecksumProgram**
Nucleus Number	1111
Description	Check the checksum of the several partitions by recalculating and comparing partition checksums
User Input	None
Example	DS:> 1111 BootCode checksum is: 0xBABE6240, which is correct Diagnostics checksum is : 0xBABEBEAD, which is correct Download checksum is: 0xBABEA6B7, which is correct Application checksum is : 0xBABEB277, which is correct 111100: Test OK @

Nucleus Name	**DS_ANAB_VideoRouting**
Nucleus Number	1112
Description	Perform the routing of the video paths on the analogue board
User Input	The user has to input the correct parameter for the routing (see table 'video routing' below).
Example	DS:> 1112 00111200: Test OK @

Video routing paths (Europe)

Path ID	Description
0	Input signal is VIDEO(CVBS) from digital board and will be re-routed back to the digital board.
1	Input signal is from FRONT VIDEO(CVBS) IN and will be routed to the digital board.
2	No Routing.
3	Input signal is from FRONT S-VIDEO(Y/C) and will be routed to the digital board.
4	No Routing.
5	Input signal is CVBS from SCART1 and will be routed to the digital board.
6	Input signal is CVBS from SCART2 and will be routed to the digital board.
7	Input Signal is CVBS from Digital Board and it will be routed to Scart1 and Scart2.
8	Input signal is VIDEO(CVBS) from ANTENNA IN and will be routed to SCART2.
9	Input signal is VIDEO(CVBS) from SCART1 and will be routed to SCART2.
10	Input signal is VIDEO(CVBS) from SCART2 and will be routed to SCART1.
11	Signal path is routed Fast Blank from Scart2 pin16 and will be routed SCART1 pin16
12	Input Signal is YC from Digital Board and it will be routed to SCART1.
13	
14	No Routing.
15	Input Signal is CVBS from TUNER and it will be routed to Digital .
16	No Routing.
17	Input Signal is routed from digital board YC to REAR S-VIDEO(YC) OUT
18	Signal path is routed from digital board RGB to RGB SCART1 and from digital board CVBS to digital board CVBS.
19	No Routing.
20	Input RGB Signal is routed from Digital Board to SCART1(RGB),Input CVBS Signal from Digital Board to Digital Board and Fast Blanking Signal from SCART2 to SCART1.
21	Input Y/C Signal from Digital Board is routed to Rear Y/C Connector and Input Y/C Signal from Front Y/C connector is routed to Digital Board.

Video routing paths (NAFTA)

Path ID	Description
0	No Routing.
1	Input signal is from FRONT VIDEO(CVBS) IN and will be routed to the digital board.This routing is same as the above path id.

2	Input signal is from REAR VIDEO(CVBS) IN and will be routed to the digital board.
3	Input signal is from FRONT S-VIDEO(Y/C) IN and the signal received will be routed to the digital board.
4	Input signal is from REAR S-VIDEO(Y/C) IN and will be routed to the digital board.
5	No Routing.
6	No routing.
7	No routing.
8	Input signal is VIDEO(CVBS) from TUNER and will be routed to Y Pin of Rear Y/C Connector.This will give only black/White Picture .
9	Input signal is from YUV IN and will be routed to YUV OUT.This is possible only if Digital Board routes back YUV signal received back to the Analogue board(DENC)
10	No routing.
11	No routing.
12	No Routing.
13	No Routing.
14	No Routing.
15	Input CVBS Signal from Tuner is routed to Digital Board..
16	No Routing.
17	No Routing.
18	Input Signal from CVBS Rear In is routed to Digital Board. This is the same as path ID 02.
19	Input Y/C signal from Digital Board is routed to Y/C Rear Out Connector and Input signal from Y/C Front In Connector is routed to Y/C Digital Board.
20	Y/C signal from Digital Board is routed to Y/C Rear Out Connector and Input signal from Y/C Rear In Connector is routed to Y/C Digital Board.
23	The Video signal received from the Digital board will be output on Modulator channel 3.
24	The Video signal received from the Digital board will be output on Modulator channel 4.

Nucleus Name	**DS_ANAB_AudioRouting**
Nucleus Number	1113
Description	Perform the routing of the audio paths on the analogue board
User Input	The user has to input the correct parameter for the routing (see table 'audio routing' below)
Example	DS:> 1113 00111300: Test OK @

Audio routing paths (Europe)

Path ID	Description
0	Input signal is from FRONT AUDIO IN and will be routed to the digital board.
1	Input signal is from FRONT AUDIO IN and will be routed to the digital board.
2	No Routing.
3	Input signal is AUDIO from SCART1 and will be routed to the digital board.
4	Input signal is AUDIO from SCART2 and will be routed to the digital board.
5	No routing.
6	No routing.
7	Input Audio signal is from the digital Board and it will be routed to the SCART1 and SCART2
8	Input AUDIO signal from TUNER and will be routed to SCART2.
9	Input signal is AUDIO from SCART1 and will be routed to SCART2.
10	Input audio signal from SCART2 is routed to SCART1.
11	Input Audio signal is routed from DVIO to SCART2.
12	
13	No Routing.
14	Input is Audio Signal from DVIO and it will be routed to Digital Board.
15	Input is Audio Signal from TUNER and it will be routed to Digital Board..
16	No routing.
17	No Routing.
18	Input signal is from FRONT AUDIO IN and will be routed to SCART2.
21	Input signal is from FRONT AUDIO IN and will be routed to the digital board.

Audio routing paths (NAFTA)

Path ID	Description
0	No Routing.
1	Input signal is from FRONT AUDIO IN and will be routed to the digital board.
2	Input signal is from REAR AUDIO IN 2 and will be routed to the digital board.

3	Input Audio Signal is routed from FRONT Cinch In to Digital Board.(This is same as path ID 01)
4	Input Signal is from Rear Cinch In1 and it will be routed to Digital Board..
5	No routing.
6	No routing.
7	No routing.
8	No Routing.
9	No routing.
10	No Routing.
11	No Routing.
12	No Routing.
13	Input Signal is from Digital Board and it will be routed to the digital board.
14	No routing.
15	Input is Audio Signal from TUNER and it will be routed to Digital Board.
16	Input signal is AUDIO from dvio board and will be routed to Digital Board.
17	No routing.
18	No routing.
19	No routing.
20	Input signal is from REAR AUDIO IN 2 and will be routed to the digital board.
21	Input signal is from REAR AUDIO IN 1 and will be routed to the digital board.
22	Input signal is from REAR AUDIO IN 1 and will be routed to the digital board.
23	The Audio signal received from the Digital board will be outputted on Modulator channel 3.
24	The Audio signal received from the Digital board will be outputted on Modulator channel 4.

<table>
<tr><td>Nucleus Name</td><td colspan="3">DS_ANAB_SelectTunerChannel</td></tr>
<tr><td>Nucleus Number</td><td colspan="3">1114</td></tr>
<tr><td>Description</td><td colspan="3">Set the tuner to receive a valid audio and video signal</td></tr>
<tr><td rowspan="9">User Input</td><td colspan="3"><Frequency*16> <video standard id>Tuner frequency: to tune the tuner to e.g. 216 MHz, this parameter must be 3456. (Since 216*16 = 3456. This is to avoid the decimal points to the parameter list.)Video standard id: The table below shows which video standards are possible</td></tr>
<tr><td>Video standard id</td><td>Europe</td><td>NAFTA</td></tr>
<tr><td rowspan="7">163248648096112</td><td>PAL_BG</td><td>NTSC</td></tr>
<tr><td>PAL_I</td><td>Invalid</td></tr>
<tr><td>PAL_DK</td><td>Invalid</td></tr>
<tr><td>SEC_L</td><td>Invalid</td></tr>
<tr><td>SEC_LS</td><td>Invalid</td></tr>
<tr><td>SEC_BG</td><td>Invalid</td></tr>
<tr><td>SEC_DK</td><td>Invalid</td></tr>
<tr><td>Example</td><td colspan="3">DS:> 1114 3456 16
111400:
Test OK @</td></tr>
</table>

<table>
<tr><td>Nucleus Name</td><td>DS_ANAB_IICWriteRead</td></tr>
<tr><td>Nucleus Number</td><td>1115</td></tr>
<tr><td>Description</td><td>Perform an IIC write and read action on the analogue board</td></tr>
<tr><td>User Input</td><td>Writing:
[<W>|<w>] [I2C address] [number of data bytes to write]
with
<data[0]...data[n]> Max 16 data bytes (n < 16).
Reading:
[<R>|<r>] [I2C address] [number of data bytes to read]
Max 16 data bytes (n < 16).</td></tr>
<tr><td>Example</td><td>DS:> 1115 w 0x94 2 0x06 0x02
111500:
Test OK @</td></tr>
</table>

Nucleus Name	**DS_ANAB_ClockAdjust**
Nucleus Number	1116
Description	Set the clock to the value passed through in the YYYY MM DD HH MM SS format
User Input	<YYYY> <MM> <DD> <HH> <MM> <SS>
Example	DS:> 1116 2002 11 11 11 11 11 111600: Test OK @

Nucleus Name	**DS_ANAB_ClockReference**
Nucleus Number	1117
Description	Generate a 1 kHz signal on pin 7 (INT) of the clock IC
User Input	None
Example	DS:> 1117 111700: Test OK @

Nucleus Name	**DS_ANAB_ClockCorrection**
Nucleus Number	1118
Description	Store the clock IC correction value in NVRAM
User Input	The correction value for the clock
Example	DS:> 1118 1000023 111800: Test OK @

Nucleus Name	**DS_ANAB_TunerAFCReferenceVoltage**
Nucleus Number	1119
Description	Store the reference voltage for the tuner in NVRAM
User Input	The reference voltage, between 0 and 255
Example	DS:> 1119 5111900: Test OK @

Nucleus Name	**DS_ANAB_TunerFrequencyDownload**
Nucleus Number	1120
Description	Store the frequency table in NVRAM. The frequency table is passed through the error-string provided to the nucleus.
User Input	See frequency table
Example	DS:> 1120 2233 00 02 4E45442031 112000: Test OK @

Nucleus Name	**DS_ANAB_StoreExternalPresets**
Nucleus Number	1121
Description	Store the external presets in NVRAM
User Input	None
Example	DS:> 1121 112100: Test OK @

Nucleus Name	**DS_ANAB_BargraphLevelAdjust**
Nucleus Number	1122
Description	Measure the audio signal corresponding to 0dB per channel and store it as correction value in NVRAM
User Input	none
Example	DS:> 1122 112200: Test OK @

Frequency download string format

Format	description	remarks
X(XXX)	Preset number	
VVWW	VV: Channel numberWW : Channel offset	

ZZ	Byte containing 8 bit fields for TRUE/FALSE : BIT 0: Decoder BIT 1: Modulation BIT 2: NICAM SAP BIT 3: Satpreset BIT 4: Presetdefined Channelpreferred BIT 5: ExtPreset BIT 6: NameManuallyChanged BIT 7: ChannelPreset	NICAM/stereo bit for Europe SAP/stereo bit for NAFTA Preset defined bit is only used for Europe. For NAFTA, renamed as channelpreferred to indicate if a channel is preferred or not. TRUE if preset is defined from P50 as extern [TGA]
HH	HfSystemFineTuning	HfS: 4 bit, FT: -4,...,4
IIJJKKLLMM	Netname	Range: A,..,Z,0,..,9,_,.. Netname length exists for Europe only. 'II' is the HEX-value for the first character, 'JJ' for the second, Ö
The message string of (DS_MessageDef *msgString) should be in the format: "X(XXX)_VVWW_ZZ_HH_IIJJKKLLMM". Here will be 'X(XXX)' a decimal value in the range of 0 to 255. V, W, Z, H, I, J, K, L, M are hex values with out the prefix '0x' (in the range 0... 9,A ... F) " _" Denotes a space character. Remarks: CHANNEL_SYSTEM is for NAFTA. PRESET_SYSTEM is for Europe.		

System (SYS)

Nucleus Name	**DS_SYS_HardwareVersionGet**
Nucleus Number	1200
Description	Get the hardware version and type of the digital board
User Input	None
Example	DS:> 1200 120000: Hardware ID = 00 The (PIO-pins) Digital Board ID = 2 Test OK @ DS:>

Nucleus Name	**DS_SYS_SoftwareVersionBootGet**
Nucleus Number	1201
Description	Get the version of the boot software on the digital board
User Input	None
Example	DS:> 1201 120100: Software Boot Version = 0001T est OK @

Nucleus Name	**DS_SYS_SoftwareVersionDownloadGet**
Nucleus Number	1202
Description	Get the version of the download software on the digital board
User Input	None
Example	DS:> 1202 120200: Software Download Version = 0001 Test OK @

Nucleus Name	**DS_SYS_SoftwareVersionApplGet**
Nucleus Number	1203
Description	Get the version of the application software on the digital board
User Input	None
Example	DS:> 1203 120300: Software Application Version = 0001 Test OK @

Nucleus Name	**DS_SYS_SoftwareVersionDiagnosticsGet**
Nucleus Number	1204
Description	Get the version of the diagnostics software on the digital board
User Input	None

Example	DS:> 1204 120400: Software Diagnostics Version = 0001 Test OK @

<table>
<tr><td>Nucleus Name</td><td colspan="2">**DS_SYS_EepromUpload**</td></tr>
<tr><td>Nucleus Number</td><td colspan="2">1205</td></tr>
<tr><td>Description</td><td colspan="2">Upload the contents of the NVRAM on the analogue board or the digital board to the service PC, by using the X-modem protocol</td></tr>
<tr><td rowspan="3">User Input</td><td colspan="2">Choose one of the following parameters for the nucleus:1. Upload the contents of the NVRAM of the digital board2. Upload the contents of the NVRAM of the analogue boardChoose in the terminal on the control PC -> transfer -> receive file. Select X-modem protocol. Then click receive in the dialogue and fill in the file name in which you want to store the data.</td></tr>
<tr><td>120503</td><td>Something went wrong while transferring the data.</td></tr>
<tr><td>120504</td><td>User cancelled the upload.</td></tr>
<tr><td>Example</td><td colspan="2">DS:> 1205
1120500:
Test OK @</td></tr>
</table>

Nucleus Name	**DS_SYS_EepromDownload**
Nucleus Number	1206
Description	Download a file with the contents of the NVRAM for the analogue board or the digital board from the service PC to the recorder, by using the X-modem protocol
User Input	Choose one of the following parameters for the nucleus:1. Download the contents of the NVRAM of the digital board2. Download the contents of the NVRAM of the analogue boardChoose in the terminal of the control PC -> transfer -> send file. Select X-modem protocol. Then choose a file with the Browse button in the dialogue and click on send.
Example	DS:> 1206 1120600: Test OK @

Nucleus Name	**DS_SYS_DvIdNumberSet**
Nucleus Number	1207
Description	Set the IEEE 1394 unique IDThe unique ID to be set.
User Input	None
Example	DS:> 1207 1234567890 120700: Test OK @

Nucleus Name	**DS_SYS_DvIdNumberGet**
Nucleus Number	1208
Description	Get the IEEE1394 ID
User Input	None
Example	DS:> 1208 120800: The DvIdNumber is: 0x0C22384E5A Test OK @

Nucleus Name	**DS_SYS_IicWrite**
Nucleus Number	1209
Description	Perform an IIC write action on the digital board
User Input	The user input the number of bytes to write followed by these bytes: <BusID><Slave address to write to><number of bytes to write><d1><d2><..><dx> Where the bus ID is either 0 (normally used) or 1
Example	DS:> 1209 0 0xa0 1 0x6 120900: 1 Bytes written Test OK @

Nucleus Name	**DS_SYS_IicRead**
Nucleus Number	1210
Description	Perform an IIC read action on the digital board
User Input	The user inputs the number of bytes to read and the address to read them from: <BusID><Slave address to read from><Number of bytes to read>Where the bus ID is either 0 (normally used) or 1

Example	DS:> 1210 0 0xa0 1 121000: Value read =0x06T est OK @

Nucleus Name	**DS_SYS_UartWrite**
Nucleus Number	1211
Description	Perform an UART write action on the digital board on a specified UART
User Input	The user inputs the UART to write to, the number of bytes and the bytes to be written to the UART. 1=UART port 1 : not used 2=UART port 2 : Bit Engine 3=UART port 3 : Analogue board <UartNr><Number of bytes to write><d1><d2><..><dx>
Example	DS:> 1211 2 2 0xd1 0x01 121100: Test OK @

Nucleus Name	**DS_SYS_UartRead**
Nucleus Number	1212
Description	Perform an UART read action on the digital board on a specified UART
User Input	The user inputs the UART to read from. 1=UART port 1 : not used 2=UART port 2 : Bit Engine 3=UART port 3 : Analogue board <UartNr >
Example	DS:> 1212 2 121200: The value that was read is: 0x50 0xD1 0x00 Test OK @

Nucleus Name	**DS_SYS_VideoLoopThroughStart**
Nucleus Number	1213
Description	The video signal, which is confirm the user input, is routed from the input to the output. Input is set with the routing nucleus 1112. All outputs are enabled.
User Input	<vipInput> <VideoOutput> <VideoStandard> 1. vipInput (CVBS, YC, YUV, RGB). 2. VideoOutput (YUV, RGB). 3. VideoStandard (PAL, NTSC).
Example	DS:> 1213 CVBS RGB PAL 121300: Test OK @

Nucleus Name	**DS_SYS_VideoLoopThroughStop**
Nucleus Number	1214
Description	Stop routing the video input to all the outputs.
User Input	-
Example	DS:> 1214 121400: Test OK @

Nucleus Name	**DS_SYS_VideoLoop**
Nucleus Number	1215
Description	Note: Before executing this nucleus the user must route the video signal on the analog board with nucleus DS_ANAB_VideoRouting(1112).
User Input	Video input of the digital board: - CVBS - YC - YUV - RGB - TEST (The video output will be routed to the video input on the digital board.) Video standard: - PAL - NTSC When no input is given, the nucleus will take TEST for video input and PAL for video standard.

Example	DS:> 1215 cvbs ntsc 121500: Test OK @ DS:> 1215 cvbs pal 121508: The VideoInputProcessor cannot detect a sync-signal. Error @ DS:> 1215 yuv ntsc 121511: Error in luminance signal(Y) Error in chrominance signal(U) Error in chrominance signal(V) Error @

Nucleus Name	**DS_SYS_AudioLoop**
Nucleus Number	1216
Description	The user first needs to select how the audio path must be routed on the analogue board (FRS_DS_ANAB_AUDIO_VIDEO_ROUTING) and/or digital board before calling this nucleus. The user also has to route the audio outputs back to the inputs by means of cables. In this nucleus the Chrysalis generates an audio sine signal with a specific signature and sends it to the output of the digital board (FRS_DS_CHR_SINE). The Chrysalis encodes the audio signal to MPEG I layer II and after this the signature of the signal will be checked.
User Input	None
Example	DS:> 1216 121600: Test OK @

Nucleus Name	**DS_SYS_SlashVersionSet**
Nucleus Number	1217
Description	Set the slash version of the system
User Input	The slash version
Example	DS:> 1217 82121700: Test OK @

Nucleus Name	**DS_SYS_SlashVersionGet**
Nucleus Number	1218
Description	Get the slash version of the system
User Input	None
Example	DS:> 1218 121800: The slash version is: 82 Test OK @

Nucleus Name	**DS_SYS_Virginize**
Nucleus Number	1219
Description	(Re-) Virginize the recorder. User data in the NVRAM of the analogue board is cleared
Example	DS:> 1219 121900: Test OK @

Nucleus Name	**DS_SYS_VirginModeOn**
Nucleus Number	1220
Description	Turn on the virgin mode functionality (e.g. the auto channel search upon start-up)
User Input	None
Example	DS:> 1220 122000: Test OK @

Nucleus Name	**DS_SYS_VirginModeOff**
Nucleus Number	1221
Description	Turn off the virgin mode functionality (e.g. the auto channel search upon start-up)
User Input	None
Example	DS:> 1221 122100: Test OK @

Nucleus Name	**DS_SYS_DisplayFatalOn**
Nucleus Number	1223
Description	Turn on the display-fatal functionality which displays debug-information on the display when encountering a fatal error condition from which could not be recovered automatically
User Input	None
Example	DS:> 1223 122300: Test OK @

Nucleus Name	**DS_SYS_DisplayFatalOff**
Nucleus Number	1224
Description	Turn off the display-fatal functionality which displays debug-information on the display when encountering a fatal error condition from which could not be recovered automatically
User Input	None
Example	DS:> 1224122400:Test OK @

Nucleus Name	**DS_SYS_DisplayFatalGet**
Nucleus Number	1225
Description	Get the display-fatal flag of the recorder
User Input	None
Example	DS:> 1225 122500: Test OK @

Nucleus Name	**DS_SYS_SettingsSet**
Nucleus Number	1226
Description	Programs the digital board settings into the boot EEPROM on the digital board.
User Input	A large hexadecimal value that represents the digital board settings obtained from the DbString.exe program or from a reference set.
Example	DS:> 1226 646961677473746201010200010101010101000020080000 122600: Test OK @

Nucleus Name	**DS_SYS_SettingsDisplay**
Nucleus Number	1228
Description	Show the settings that are programmed in the BROM on the digital board.
User Input	None.
Example	DS:> 1228 Settings ID: 6D7920626F617264000203000101010201010000020080000 Board name: my board Hardware ID: 0 Codec IC: PNX7100_MF2 Video Input Processor IC: SAA7118 Progressive Scan Deinterlacer IC: None Progressive Scan Denc IC: ADV7196 I-Link physical layer circuit IC: PDI1394P25 I-Link link layer circuit IC: PDI1394P40 Audio clock: Clock scheme 1 Bit engine connector: available IDE connector 1: available IDE connector 2: not available PCI connector: not available RAM size 32MByte ROM size (NOR FLASH bank 1) 8MByte ROM size (NOR FLASH bank 2) Not available ROM size (NAND FLASH) Not available Bit Engine: AV 2.0 122800: Test OK @

Nucleus Name	**DS_SYS_SettingsGet**
Nucleus Number	1229
Description	Get the digital board diversity settings string that is programmed in the BROM on the digital board.
User Input	None.

Example	

```
DS:> 1229
122900: 6D7920626F61726400020300010101020101000020080000
Test OK @
```

Nucleus Name	**DS_SYS_AudioLoopThroughStart**
Nucleus Number	1230
Description	Description: The audio input is routed from the an input to all outputs. Input is set with the routing nucleus 1113. All outputs are enabled.
User Input	None.
Example	

```
DS:> 1230
123000:
Test OK @
```

Nucleus Name	**DS_SYS_AudioLoopThroughStop**
Nucleus Number	1231
Description	Stop routing the audio input to all the outputs
User Input	-
Example	

```
DS:> 1231
123100:
Test OK @
```

Nucleus Name	**DS_SYS_SettingsHwIdSet**
Nucleus Number	1232
Description	Double check whether stored HW-string equals actual HW as far as we can automatically detect this. An automatic and a manual mode is supported.
User Input	- 'manual' or 'MANUAL' to enter manual mode - default is automatic mode where the nucleus stops upon and reports the first encountered error
Example	

```
DS:> 1233
123300:
Test OK @

DS:> 1233 manual
123300:
Test OK @

DS:> 1233
123301:Hardware ID mismatch: in HW-Diversity string:99, actual in FLASH:0

Error @

DS:> 1233 manual
Hardware ID mismatch! in HW-Diversity string:99, actual in FLASH:0

Enter the correct HW ID of the digital board.
>  0
The HW-diversity string has been modified by you. Settings:
Board name:                     DIAG
Hardware ID:                    0
Codec IC:                       PNX7100_MF3
Video Input Processor IC:       SAA7118
Progressive Scan Deinterlacer IC:  None
Progressive Scan Denc IC:       ADV7196
I-Link physical layer circuit IC:  PDI1394P25
I-Link link layer circuit IC:   PDI1394P40
Audio clock:                    Clock scheme 1
Bit engine connector:           available
IDE connector 1:                available
IDE connector 2:                not available
PCI connector:                  not available
RAM size                        32MByte
ROM size (NOR FLASH bank 1)     8MByte
ROM size (NOR FLASH bank 2)     Not available
ROM size (NAND FLASH)           Not available
Is it OK to program this inthe new HW-diversity string? ([y]es/[n]o):y
Diversity HW-string programmed successfully.
123300:
Test OK @

DS:>
```

Nucleus Name	**DS_SYS_SettingsDoubleCheck**
Nucleus Number	1233
Description	This nucleus sets the HW-Id in the HW-diversity string
User Input	- <HW-ID> - The hardware ID to set -No input - The user will be asked for the ID
Example	DS:> 1232 Enter the new HW ID of the digital board (Currently equals 21) Enter a value between 0 and 99: > 22 The HW ID will be set to: 22. Is that correct? ([Y/N]):y 123200: Test OK @ DS:> 1232 Enter the new HW ID of the digital board (Currently equals 22) Enter a value between 0 and 99: > The HW ID will be set to: 0. Is that correct? ([Y/N]):N 123202: Setting the HW ID was aborted by the user. Error @ DS:> 1232 99 123200: Test OK @

Electronic Program Guide Board (EPGB)

Nucleus Name	**DS_EPGB_VersionGet**
Nucleus Number	1300
Description	Returns the version of the EPG board.
User Input	None
Example	DS:> 1300 130000: Version : 6.1.9 Test OK @

PCMCIA INTERFACE (PCMCIA)

Nucleus Name	**DS_PCMCIA_Reset**
Nucleus Number	1400
Description	Reset the PCMCIA device by sending a reset command through IDE
Example	DS:> 1400 140000: Test OK @

Nucleus Name	**DS_PCMCIA_Inquiry**
Nucleus Number	1401
Description	Get the vendor- and product identification and the product revision level of the media in the slot.
Example	DS:> 1401 140100: Test OK @

Nucleus Name	**DS_PCMCIA_WriteRead**
Nucleus Number	1402
Description	Perform a Write Read test to a random sector on the inserted medium in the PCMCIA device and check if the data read is equal to the data written.
Example	DS:> 1402 140200: Test OK @

Nucleus Name	**DS_PCMCIA_Diagnostics**
Nucleus Number	1403
Description	Shall perform the internal diagnostic tests implemented by the PCMCIA slot. The electronics of the PCMCIA slot are tested here, not the inserted medium.
Example	DS:> 1403 140300: Test OK @

HARD DISK DRIVE (HDD)

Nucleus Name	**DS_HDD_SpinOff**	
Nucleus Number	2110	
Description	Put the HDD in parking position by sending the sleep command so it can be moved without endangering the mechanical parts	
User Input	None	
Error	Number	Description
	210500	The spin off of the hard disk drive device succeeded
	210501	The initialisation of IDE failed
	210501	The initialisation of IDE failed
	210501	The sleep ATA command failed
Example	DS:> 2105 210500: Test OK @	

Script

Nucleus Name	**DS_IH_ScriptHandler**
Nucleus Number	Script
Description	
Included tests:	1. DS_ANAB_COMMUNICATIONECHO_NUC 2. DS_DCB_COMMUNICATIONECHO_NUC 3. DS_BROM_COMMUNICATION_NUC 4. DS_SYS_SETTINGSDISPLAY_NUC 5. DS_CHR_DEVTYPEGET_NUC 6. DS_CHR_INT_PIC_NUC 7. DS_CHR_DMA_NUC 8. DS_BROM_WRITEREAD_NUC 9. DS_NVRAM_COMMUNICATION_NUC 10. DS_NVRAM_WRITEREAD_NUC 11. DS_SDRAM_WRITEREADFAST_NUC 12. DS_FLASH_WRITEREAD_NUC 13. DS_FLASH_CHECKSUMPROGRAM_NUC 14. DS_SYS_HARDWAREVERSIONGET_NUC 15. DS_VIP_DEVTYPEGET_NUC 16. DS_VIP_COMMUNICATION_NUC 17. DS_DVIO_LINKDEVTYPEGET_NUC 18. DS_DVIO_PHYDEVTYPEGET_NUC 19. DS_DVIO_LINKCOMMUNICATION_NUC 20. DS_DVIO_PHYCOMMUNICATION_NUC 21. DS_PSCAN_COMMUNICATIONDENC_NUC 22. DS_PSCAN_COMMUNICATIONDEINTERLACER_NUC 23. DS_BE_COMMUNICATIONECHO_NUC 24. DS_ANAB_COMMUNICATIONIICNVRAM_NUC 25. DS_ANAB_COMMUNICATIONIICTUNER_NUC 26. DS_ANAB_COMMUNICATIONIICSOUNDPROCESSOR_NUC 27. DS_ANAB_COMMUNICATIONIICAVSELECTOR_NUC 28. DS_ANAB_CHECKSUMPROGRAM_NUC
User Input	None

Example

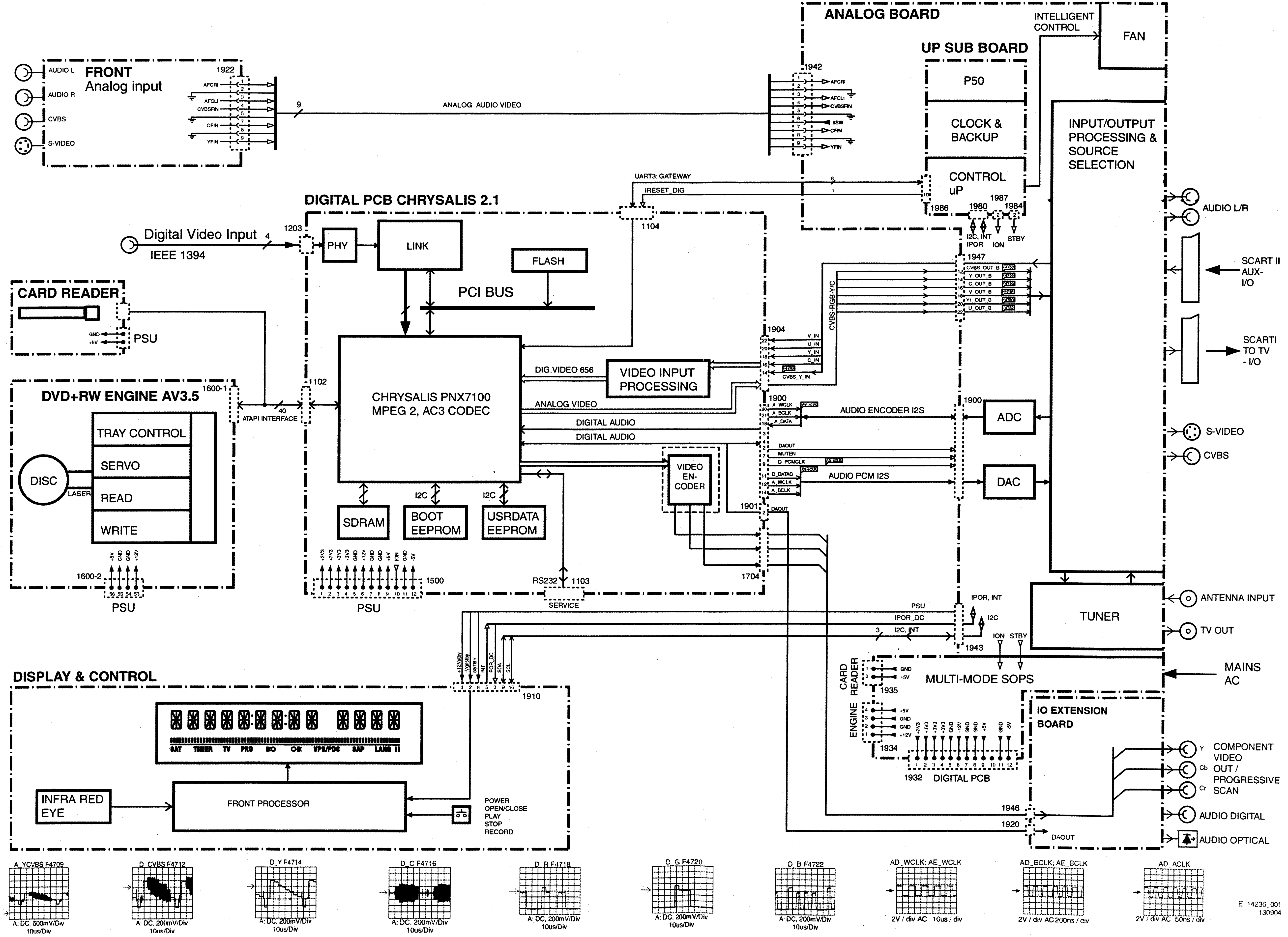
```
DS:> script
Executing User/Dealer script.
Busy executing NUC1100 1-28
Hello Analogue Board
Busy executing NUC1000 2-28
Busy executing NUC200 3-28
Busy executing NUC1228 4-28
Settings ID: 4C4541440D00000000030300010101020101000020080000
Board name: LEAD
Hardware ID: 0
Codec IC: PNX7100_MF3
Video Input Processor IC: SAA7118
Progressive Scan Deinterlacer IC: None
Progressive Scan Denc IC: ADV7196
I-Link physical layer circuit IC: PDI1394P25
I-Link link layer circuit IC: PDI1394P40
Audio clock: Clock scheme 1
Bit engine connector: available
IDE connector 1: available
IDE connector 2: not available
PCI connector: not available
RAM size 32MByte
ROM size (NOR FLASH bank 1) 8MByte
ROM size (NOR FLASH bank 2) Not available
ROM size (NAND FLASH) Not available
Bit Engine: AV 2.0
Busy executing NUC100 5-28
Device ID 7100
Codec ID PNX7100_MF3
F-BCU (0x0102) 1.0 INTC (0x011d) 1.0 PCI-XIO(0x0113) 1.0
SIF (0x013b) 1.0 EJTAG (0x0104) 0.0 S-BCU (0x0102) 1.0
BOOT (0x010a) 1.0 CONFIG (0x013f) 1.0 RESET (0x0123) 1.0
DEBUG (0x0116) 0.0 UART0 (0x0107) 0.1 UART1 (0x0107) 0.1
UART2 (0x0107) 0.1 UART3 (0x0107) 0.1 I2C0 (0x0105) 0.1
I2C1 (0x0105) 0.1 GPIO (0x013c) 1.0 SYNC (0x013a) 1.0
DISP0 (0xa015) 0.2 DISP1 (0xa00f) 0.0 OSD (0x0136) 0.1
SPU (0xa00e) 0.0 MIXER (0x0137) 1.0 DENC (0x0138) 0.1
CCIR (0x0139) 1.0 VDEC (0x0133) 0.1 PARSER (0xa00d) 0.0
DV (0xa00c) 0.0 BEI (0xa00a) 0.0 IDE (0xa009) 0.0
SGDX (0xa008) 0.0 BYTE (0xa00b) 0.0 OUTPUT (0xa003) 0.0
ACOMP (0xa000) 0.0 VFE (0xa001) 0.0 VCOMP (0xa002) 0.0
SCR (0x0000) 0.0 SIFF (0xa011) 0.0 WMD (0xa010) 0.0
AUDIO0 (0xa015) 0.2 AUDIO1 (0xa00f) 0.0 PSCAN (0xa018) 0.0
Busy executing NUC114 6-28
Busy executing NUC115 7-28
Busy executing NUC201 8-28
Busy executing NUC300 9-28
Busy executing NUC301 10-28
Busy executing NUC401 11-28
Busy executing NUC501 12-28
Busy executing NUC503 13-28
BootCode checksum is: 0xBABEB432, which is correct
Diagnostics checksum is: 0xBABED22B, which is correct
Download checksum is: 0xBABE025F, which is correct
Application checksum is: 0xBABE2825, which is correct
Busy executing NUC1200 14-28
Hardware ID = 00
Busy executing NUC600 15-28
Found SAA7118
```

Example

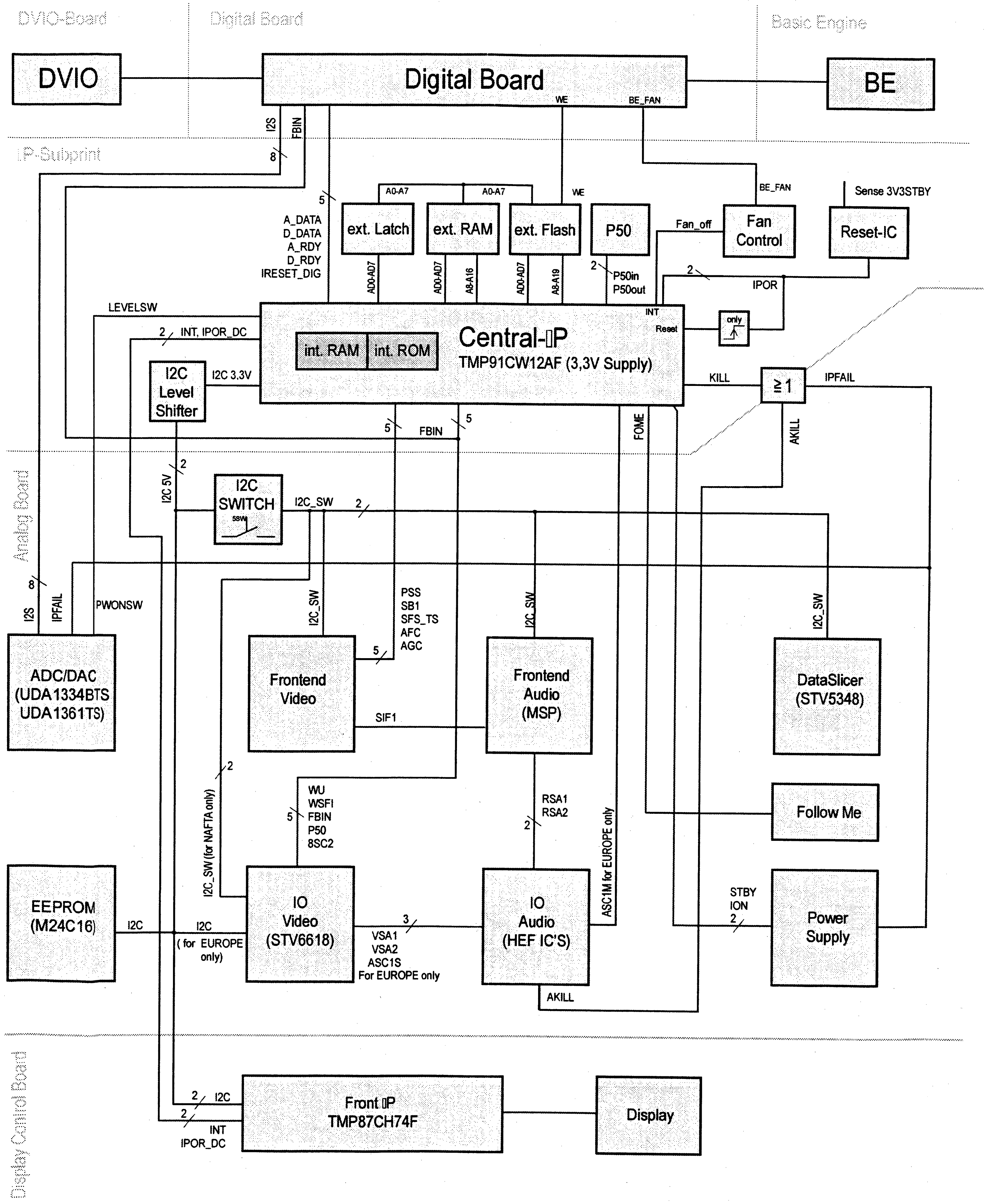
```
Busy executing NUC601 16-28
Busy executing NUC700 17-28
Device type of the link layer IC: ffc00301
Busy executing NUC701 18-28
Device type of the phy layer IC: 0
Busy executing NUC702 19-28
Busy executing NUC703 20-28
Busy executing NUC801 21-28
Busy executing NUC808 22-28
The IIC acknowledge was not received, which is correct
Busy executing NUC900 23-28
Busy executing NUC1101 24-28
Busy executing NUC1102 25-28
Busy executing NUC1104 26-28
Busy executing NUC1105 27-28
Busy executing NUC1111 28-28
BootCode checksum is: 0xBABE6240, which is correct
Diagnostics checksum is: 0xBABEDC9A, which is correct
Download checksum is: 0xBABEA6B7, which is correct
Application checksum is: 0xBABE5968, which is correct
PASS
DS:>
```

6. Block Diagrams, Waveforms, Wiring Diagram.

Overall Block Diagram Digital Board 2.1 Chrysalis

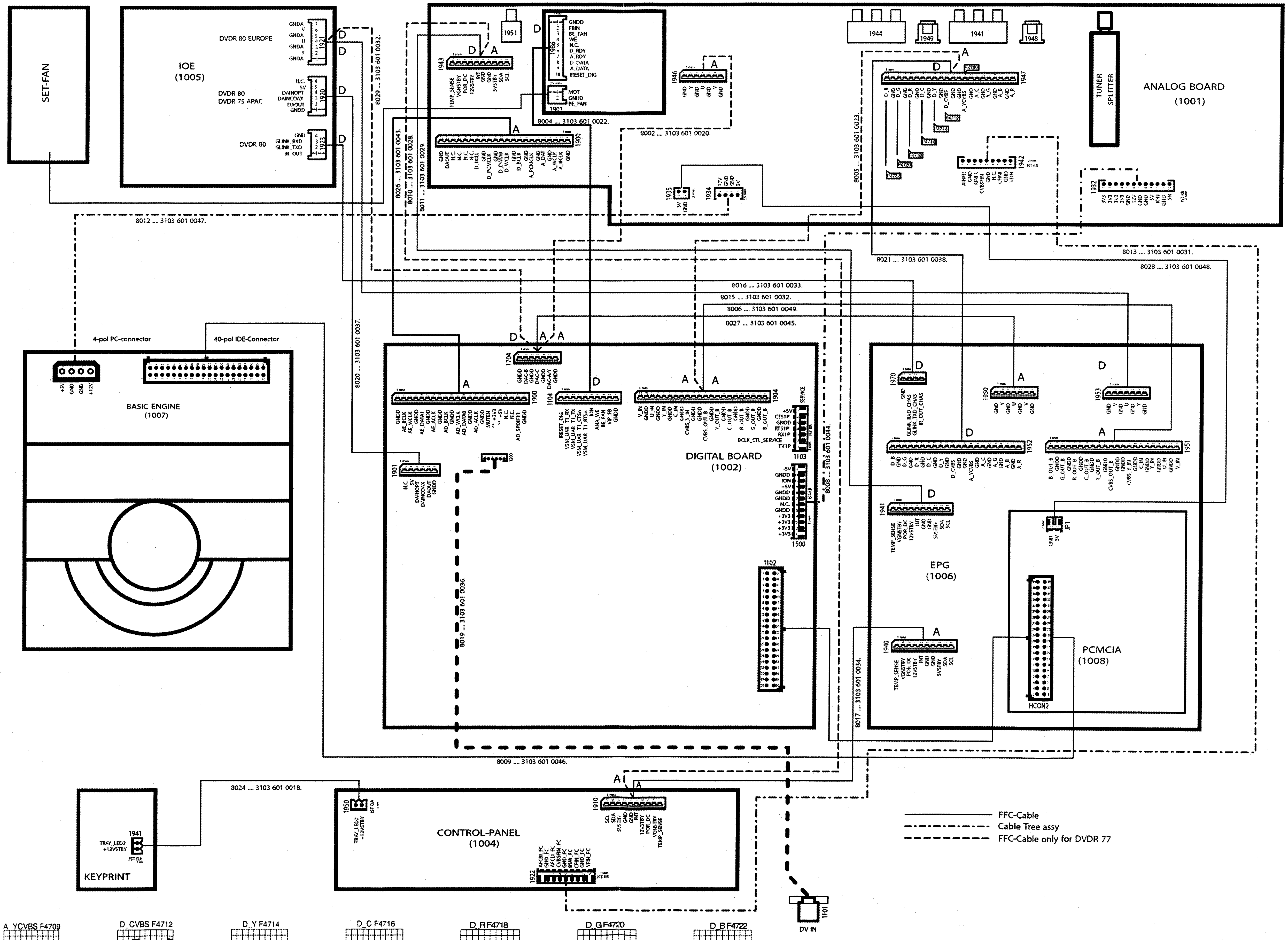

ANALOG BOARD
INTELLIGENT CONTROL
FAN
UP SUB BOARD
P50
CLOCK & BACKUP
CONTROL uP
INPUT/OUTPUT PROCESSING & SOURCE SELECTION
FRONT Analog input
AUDIO L
AUDIO R
CVBS
S-VIDEO
1922
AFCRI
AFCLI
CVBSFIN
CFIN
YFIN
9
ANALOG AUDIO VIDEO
1942
8SW
UART3: GATEWAY
IRESET_DIG
6
1
1986
1980
1987
1984
I2C, INT
IPOR
ION
STBY
DIGITAL PCB CHRYSALIS 2.1
1104
Digital Video Input
IEEE 1394
4
1203
PHY
LINK
FLASH
PCI BUS
CARD READER
GND
+5V
PSU
DVD+RW ENGINE AV3.5
1600-1
40
ATAPI INTERFACE
1102
TRAY CONTROL
SERVO
READ
WRITE
DISC
LASER
-5V GND GND +12V
1600-2
56 55 54 53
PSU
CHRYSALIS PNX7100 MPEG 2, AC3 CODEC
DIG.VIDEO 656
VIDEO INPUT PROCESSING
ANALOG VIDEO
DIGITAL AUDIO
DIGITAL AUDIO
VIDEO EN-CODER
SDRAM
I2C
BOOT EEPROM
I2C
USRDATA EEPROM
1500
PSU
RS232
1103
SERVICE
1904
V_IN
U_IN
Y_IN
C_IN
CVBS_Y_IN
CVBS-RGB-Y/C
1947
CVBS_OUT_B
Y_OUT_B
C_OUT_B
V_OUT_B
Y1_OUT_B
U_OUT_B
1900
A_WCLK
A_BCLK
A_DATA
AUDIO ENCODER I2S
DAOUT
MUTEN
D_PCMCLK
D_DATAO
A_WCLK
A_BCLK
AUDIO PCM I2S
1901
DAOUT
1704
1900
ADC
DAC
AUDIO L/R
SCART II AUX-I/O
SCARTI TO TV - I/O
S-VIDEO
CVBS
TUNER
ANTENNA INPUT
TV OUT
MAINS AC
PSU
IPOR_DC
3
I2C, INT
IPOR, INT
I2C
ION
STBY
1943
CARD READER
GND
+5V
1935
MULTI-MODE SOPS
ENGINE READER
+5V
GND
GND
+12V
1934
1932 DIGITAL PCB
IO EXTENSION BOARD
COMPONENT VIDEO OUT / PROGRESSIVE SCAN
Y
Cb
Cr
1946
1920
DAOUT
AUDIO DIGITAL
AUDIO OPTICAL
DISPLAY & CONTROL
+12Vstby
-Vgridstby
SSTBY
INT
POR_DC
SDA
SCL
1910
SAT TIMER TV PRG MO OK VPS/PDC SAP LANG II
FRONT PROCESSOR
INFRA RED EYE
POWER
OPEN/CLOSE
PLAY
STOP
RECORD
A_YCVBS F4709
A: DC, 500mV/Div 10us/Div
D_CVBS F4712
A: DC, 200mV/Div 10us/Div
D_Y F4714
A: DC, 200mV/Div 10us/Div
D_C F4716
A: DC, 200mV/Div 10us/Div
D_R F4718
A: DC, 200mV/Div 10us/Div
D_G F4720
A: DC, 200mV/Div 10us/Div
D_B F4722
A: DC, 200mV/Div 10us/Div
AD_WCLK; AE_WCLK
2V / div AC 10us / div
AD_BCLK; AE_BCLK
2V / div AC 200ns / div
AD_ACLK
2V / div AC 50ns / div
E_14230_001
130904

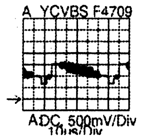
Control Block Diagram Analog Board, uP Board

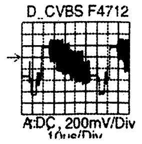

DVIO-Board
Digital Board
Basic Engine
DVIO
Digital Board
BE
WE
BE_FAN
I2S
FBIN
8
μP-Subprint
5
A_DATA
D_DATA
A_RDY
D_RDY
IRESET_DIG
A0-A7
A0-A7
WE
BE_FAN
Sense 3V3STBY
ext. Latch
ext. RAM
ext. Flash
P50
Fan_off
Fan Control
Reset-IC
A0-AD7
A0-AD7
A8-A16
A0-AD7
A8-A19
2
P50in
P50out
2
IPOR
INT
Reset
only
LEVELSW
2
INT, IPOR_DC
int. RAM
int. ROM
Central-μP
TMP91CW12AF (3,3V Supply)
KILL
≥1
IPFAIL
I2C Level Shifter
I2C 3,3V
5
FBIN
5
FOME
AKILL
I2C 5V
2
I2C SWITCH
I2C_SW
2
Analog Board
8
I2S
IPFAIL
PWONSW
I2C_SW
PSS
SB1
SFS_TS
AFC
AGC
I2C_SW
I2C_SW
5
ADC/DAC (UDA1334BTS UDA1361TS)
Frontend Video
Frontend Audio (MSP)
DataSlicer (STV5348)
SIF1
2
WU
WSFI
FBIN
P50
8SC2
5
RSA1
RSA2
2
Follow Me
ASC1M for EUROPE only
I2C_SW (for NAFTA only)
STBY
ION
2
EEPROM (M24C16)
I2C
I2C (for EUROPE only)
IO Video (STV6618)
3
VSA1
VSA2
ASC1S
For EUROPE only
IO Audio (HEF IC'S)
Power Supply
AKILL
Display Control Board
2
I2C
2
INT
IPOR_DC
Front μP TMP87CH74F
Display

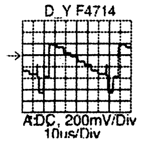
TR 01019_001
130502

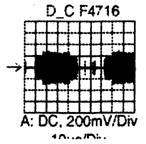
Wiring Diagram

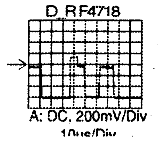

SET-FAN
IOE (1005)
DVDR 80 EUROPE
DVDR 80 DVDR 75 APAC
DVDR 80
1921
1920
1923
1943
1951
1986
1901
1900
1946
1944
1949
1941
1948
1947
TUNER SPLITTER
ANALOG BOARD (1001)
1942
1932
1935
1934
8029 .... 3103 601 0032.
8004 .... 3103 601 0022.
8002 .... 3103 601 0020.
8005 .... 3103 601 0023.
8026 .... 3103 601 0043.
8010 .... 3103 601 0028.
8011 .... 3103 601 0029.
8012 .... 3103 601 0047.
8013 .... 3103 601 0031.
8028 .... 3103 601 0048.
8021 .... 3103 601 0038.
8016 .... 3103 601 0033.
8015 .... 3103 601 0032.
8006 .... 3103 601 0049.
8027 .... 3103 601 0045.
8020 .... 3103 601 0037.
8008 .... 3103 601 0044.
8019 .... 3103 601 0036.
8017 .... 3103 601 0034.
8009 .... 3103 601 0046.
8024 .... 3103 601 0018.
4-pol PC-connector
40-pol IDE-Connector
BASIC ENGINE (1007)
1704
1104
1903
1904
1103
1500
1102
1901
DIGITAL BOARD (1002)
1970
1950
1953
1952
1951
1941
EPG (1006)
1940
PCMCIA (1008)
HCON2
KEYPRINT
1941
1950
CONTROL-PANEL (1004)
1910
1922
1101
DV IN
FFC-Cable
Cable Tree assy
FFC-Cable only for DVDR 77

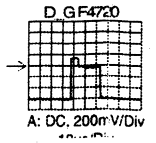

A_YCVBS F4709

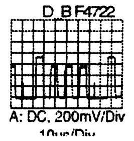

D_CVBS F4712


D_Y F4714


D_C F4716


D_R F4718


D_G F4720

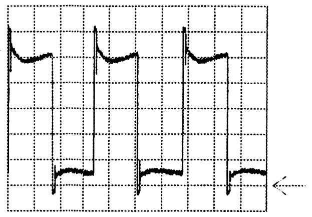

D_B F4722

TR 13001_001
200803

Waveforms

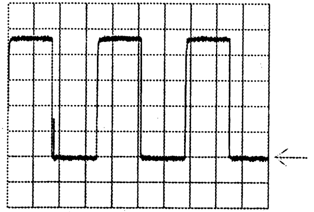
Waveforms Display Board

7106/7108-Emitter



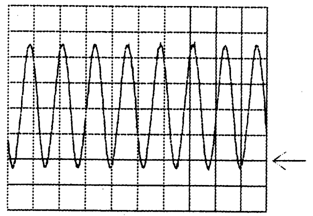
A: DC, 2 V/Div, 10us/Div

IC7103-19



A: DC, 1 V/Div, 10us/Div

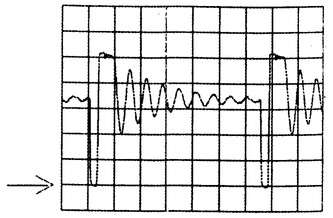
IC7103-8



A: DC, 1 V/Div, 100ns/Div

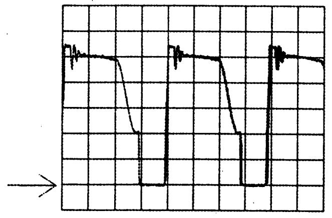
Waveforms Analog Board

F327 VDrain (Standby)



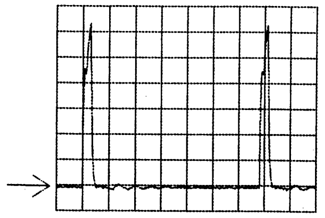
A: DC, 100V/Div
5us/Div

F327 VDrain (no disc loaded)



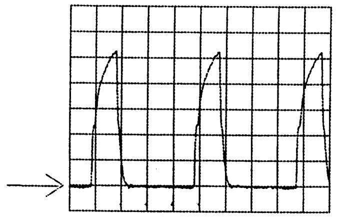
A: DC, 100V/Div
2us/Div

I324 VGate (Standby)



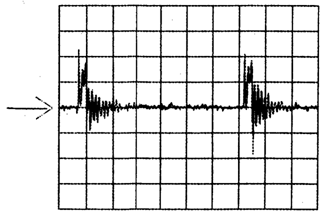
A: DC, 1V/Div
5us/Div

I324 VGate (no disc loaded)



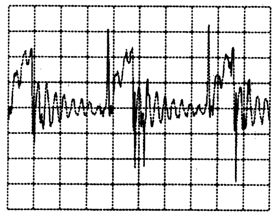
A: DC, 2V/Div
2us/Div

I324 VSource (Standby)



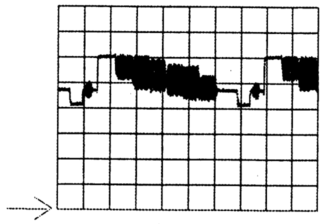
A: DC, 50mV/Div
5us/Div

I324 VSource (no disc loaded)



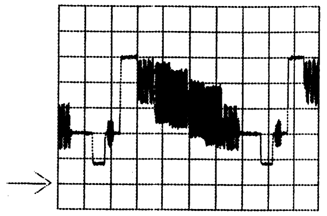
A: DC, 50mV/Div
2us/Div

F723 VFV I723



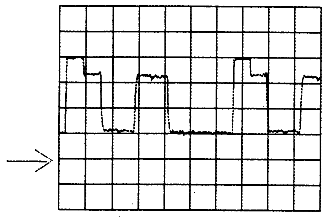
A: DC, 500mV/Div
10us/Div

E465



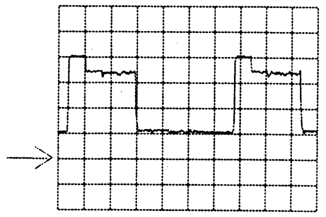
A: DC, 500mV/Div
10us/Div

E461



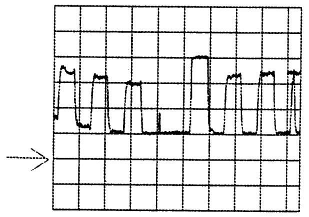
A: DC, 500mV/Div
10us/Div

E462



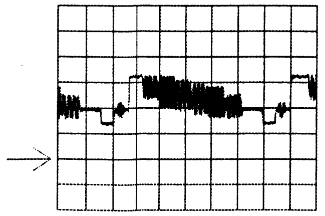
A: DC, 500mV/Div
10us/Div

E463



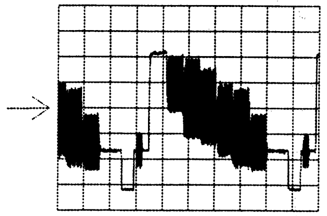
A: DC, 500mV/Div
10us/Div

A_CVBS I405



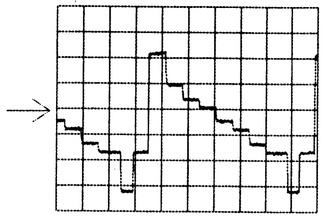
A: DC, 500mV/Div
10us/Div

D_CVBS F4712



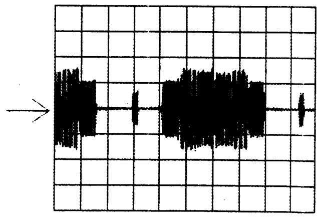
A: DC, 200mV/Div
10us/Div

D_Y F4714



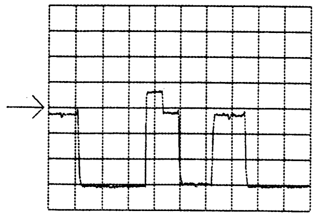
A: DC, 200mV/Div
10us/Div

D_C F4716



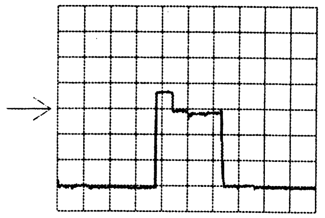
A: DC, 200mV/Div
10us/Div

D_R F4718



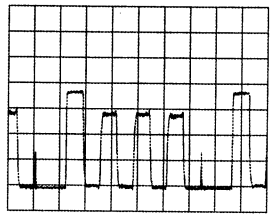
A: DC, 200mV/Div
10us/Div

D_G F4720



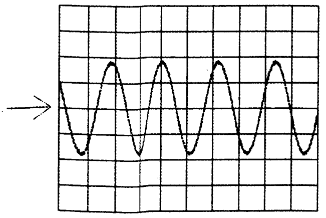
A: DC, 200mV/Div
10us/Div

D_B F4722



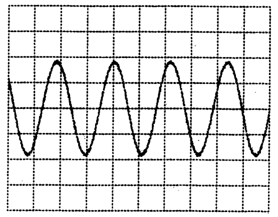
A: DC, 200mV/Div
10us/Div

I502/I504



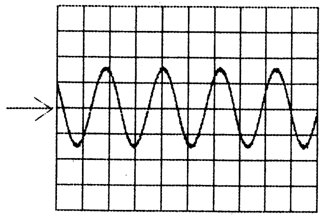
A: DC, 500mV/Div
500us/Div

I517/I518



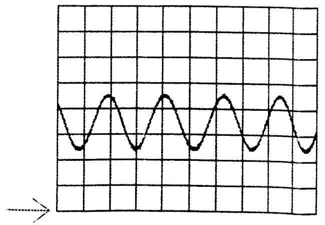
A: DC, 500mV/Div
500us/Div

F501/F502



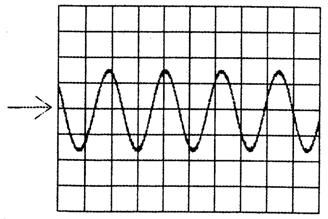
A: DC, 500mV/Div
500us/Div

I014/I032



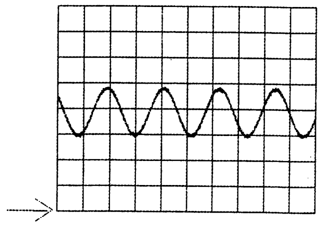
A: DC, 500mV/Div
500us/Div

ARDAC/ALDAC F010/F011



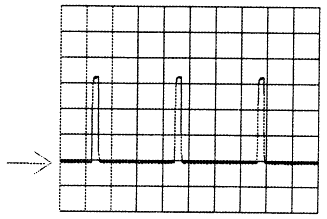
A: DC, 500mV/Div
500us/Div

I623



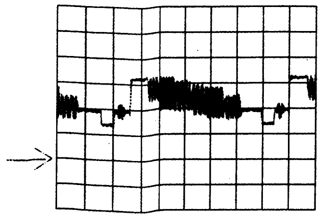
A: DC, 1 V/Div
500us/Div

SYNC F843



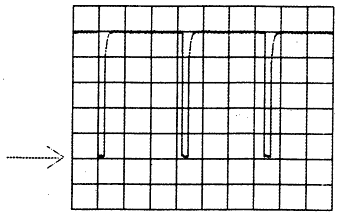
A: DC, 500mV/Div
10us/Div

A_CVBS F8008



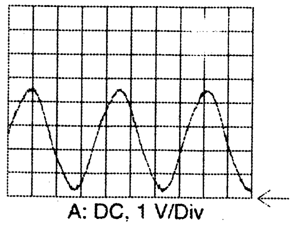
A: DC, 500mV/Div

I818



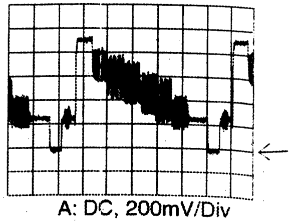
A: DC, 1 V/Div

I994



A: DC, 1 V/Div
20ns/Div

I989

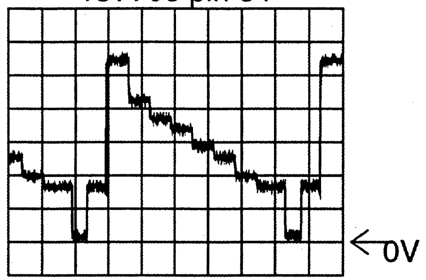


A: DC, 200mV/Div
10us/Div

TR 070018_001
200303

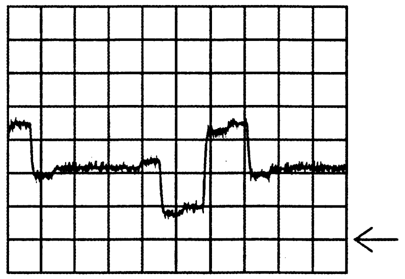
Waveforms Digital Board Chrysalis 2.1

IC7703 pin 34



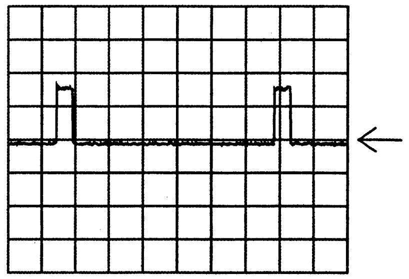
A: DC, 200mV/Div, 5us/Div

IC7703 pin 36



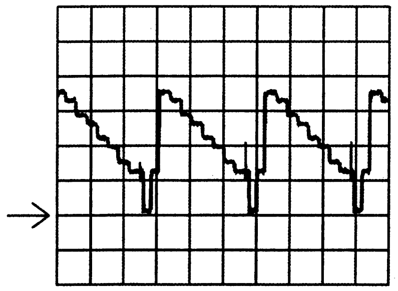
A: DC, 200mV/Div, 5us/Div

HS_IN



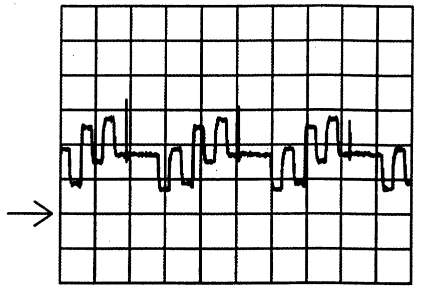
A: DC, 2 V/Div, 10us/Div

Y 1704-2



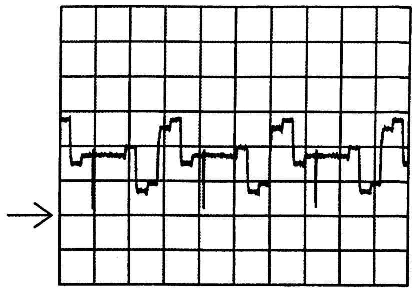
A: DC, 500mV/Div
10us/Div

PB 1704-4



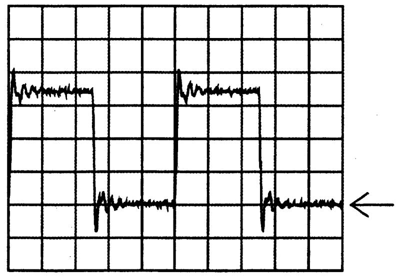
A: DC, 500mV/Div
10us/Div

PR 1704-6



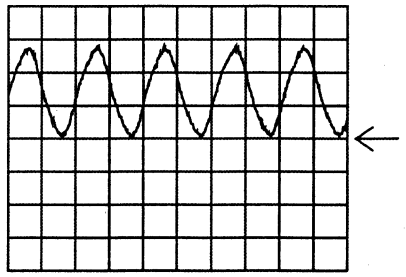
A: DC, 500mV/Div
10us/Div

IC7402 pin 3, F405



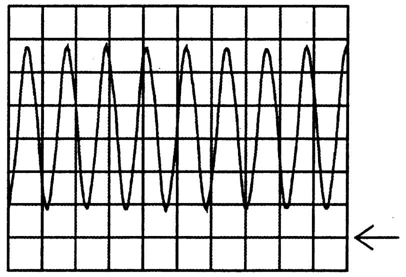
A: DC, 1 V/Div, 50ns/Div

IC7200 pin 60, F203



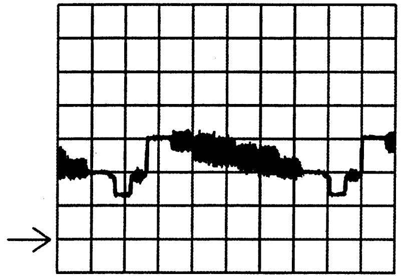
A: DC, 1 V/Div, 20ns/Div

X1001



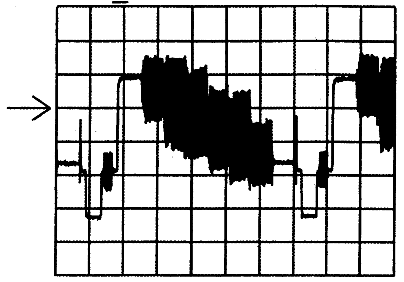
A: DC, 500mV/Div, 2us/Div

A_YCVBS 1904-14



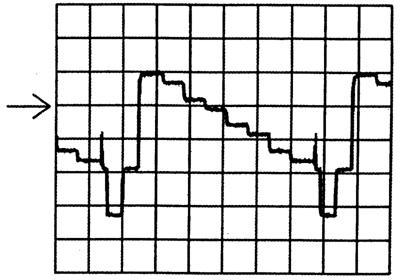
A: DC, 500mV/Div
10us/Div

D_YCVBS 1904-11



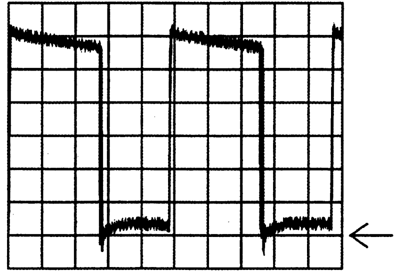
A: DC, 200mV/Div
10us/Div

D_Y 1904-9



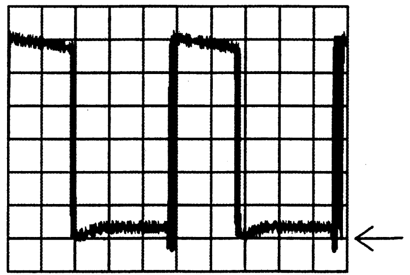
A: DC, 200mV/Div
10us/Div

IC7501 pin 5



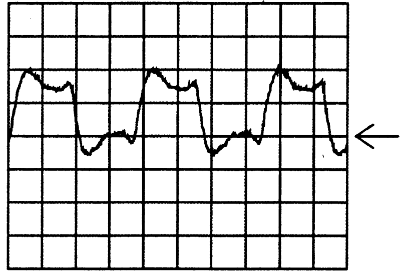
A: DC, 2 V/Div, 1us/Div

IC7501 pin 6



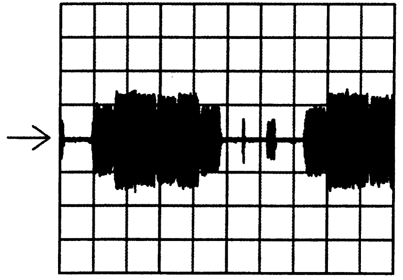
A: DC, 2 V/Div, 1us/Div

IC7703 pin 25



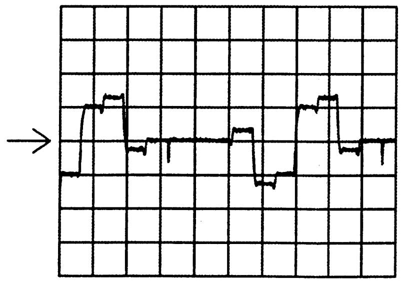
A: DC, 2 V/Div, 10ns/Div

D_C 1904-7



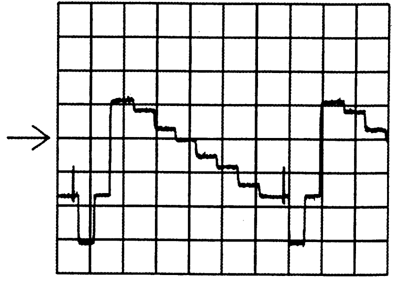
A: DC, 200mV/Div
10us/Div

D_VR 1904-5



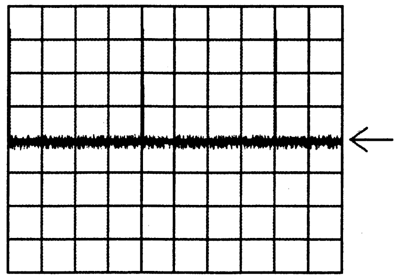
A: DC, 200mV/Div
10us/Div

D_YG 1904-3



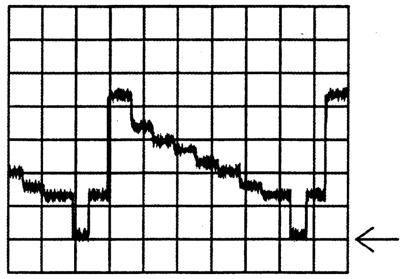
A: DC, 200mV/Div
10us/Div

VS_IN



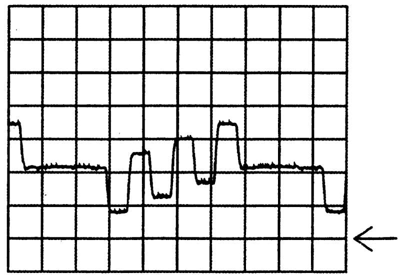
A: DC, 1 V/Div, 5ms/Div

1704-2, F1702



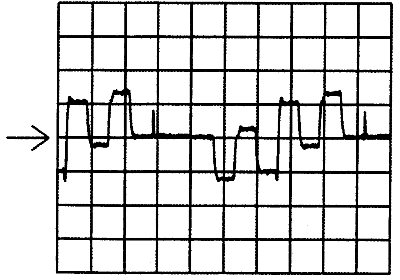
A: DC, 500mV/Div, 5us/Div

IC7703 pin 32



A: DC, 200mV/Div, 5us/Div

D_UB 1904-1



A: DC, 200mV/Div
10us/Div

TR 09014_001
220403

Test points overview Analog Board

F0001	A10
F0002	C10
F0003	C10
F0005	C10
F0007	C10
F0009	C10
F0010	C9
F0011	C10
F0012	C10
F0014	C10
F0016	C10
F0021	A10
F006	C9
F007	C8
F008	C9
F009	C9
F010	A10
F011	B10
F300	A3
F301	A3
F302	A4
F304	B1
F305	B2
F306	A1
F307	B1
F308	A2
F309	A2
F310	A2
F311	A2
F312	B1
F313	A1
F314	A1
F315	C1
F316	C2
F317	C4
F318	C2
F319	C2
F320	C1
F321	C3
F322	C4
F323	B1
F324	B3
F325	A9
F326	B2
F328	B1
F329	B1
F331	A3
F333	A3
F334	A2
F335	A2
F336	A2
F337	A2
F338	B1
F339	B1
F340	A2
F341	B3
F342	C1
F343	A2
F344	C9
F346	A2
F347	C8
F348	C8
F349	C3
F350	C3
F351	A3
F352	C8
F353	C8
F354	A2
F355	C3
F356	C3
F357	C3
F358	C6
F359	C8
F360	C3
F361	C2
F362	A2
F363	A2
F364	A3
F366	B2
F367	B2
F368	B2
F369	B2
F371	A3
F372	A3
F373	B3
F374	B3
F381	C8
F382	C9
F383	C8
F384	C8
F401	A9
F4102	A9
F4103	A9
F412	A8
F4203	C5
F4205	C6
F4207	C6
F4209	C6
F4210	B5
F4505	A9
F4707	A6
F4712	B6
F4714	B6
F4716	B6
F4718	B6
F4720	B6
F4721	A6
F4722	B6
F485	A6
F499	A4
F501	A7
F502	A7
F504	A3
F5101	A5
F5102	A5
F5103	A5
F5106	A5
F5108	A5
F5110	A5
F5113	A4
F5116	A5
F5119	A4
F5120	A4
F5201	A5
F5202	A5
F5203	A5
F5206	A5
F5207	A5
F5208	A5
F5210	A5
F5211	A5
F5213	A4
F5215	A5
F5216	C8
F5219	A4
F5220	A4
F6001	C6
F6002	C10
F6004	C6
F701	A3
F702	B4
F703	A3
F704	A3
F707	A3
F708	B5
F709	B4
F710	B3
F713	C7
F913	B5
F950	C9
I001	C10
I002	B10
I004	C10
I005	B10
I006	B9
I007	B10
I008	B9
I009	B9
I013	B9
I014	B10
I015	B9
I018	B10
I019	B10
I020	A9
I021	B9
I022	C9
I023	B10
I029	C10
I030	B9
I031	C10
I032	B10
I036	A9
I300	A1
I301	A3
I303	B2
I304	B3
I305	B3
I306	A1
I307	C1
I308	B2
I309	B3
I310	C2
I311	B1
I312	B1
I313	B3
I314	A1
I315	B3
I316	A1
I317	A1
I318	C3
I319	C3
I320	C3
I321	B1
I322	B1
I323	A3
I324	B1
I325	B1
I326	A2
I327	B2
I329	A2
I330	C1
I331	C1
I332	B2
I333	A3
I334	A2
I335	C1
I336	B2
I337	A3
I338	A3
I339	A2
I340	C1
I341	A5
I342	A2
I343	C1
I344	C2
I345	A2
I346	A3
I347	B7
I348	C1
I349	B7
I350	C2
I351	C2
I352	B7
I353	A3
I354	A3
I355	C2
I356	A2
I357	A2
I361	A2
I402	A6
I405	A10
I406	A4
I407	A4
I408	A4
I409	A4
I411	B6
I412	B6
I413	C5
I414	A5
I415	C6
I416	B5
I417	B5
I418	C4
I419	C9
I420	C9
I424	A4
I428	A7
I429	A9
I431	A7
I433	A7
I434	A7
I437	A6
I438	B6
I439	A6
I440	A6
I441	A6
I442	B7
I443	A7
I444	A6
I445	A6
I446	B6
I447	B6
I448	A7
I449	A6
I451	A6
I453	A9
I454	A9
I456	B6
I457	B5
I458	A5
I459	A5
I460	A5
I461	A4
I462	A4
I463	A4
I464	A4
I465	A4
I466	B5
I467	A6
I468	B6
I469	B5
I470	B5
I476	A5
I478	B6
I479	B5
I481	B6
I482	B6
I483	B5
I484	A5
I485	A7
I486	A6
I487	A9
I488	A9
I489	A9
I490	A10
I491	A10
I492	A9
I493	A9
I501	A8
I502	B8
I503	A8
I504	B8
I505	C5
I506	B5
I507	A9
I508	A7
I509	A8
I510	A8
I511	A8
I513	B7
I514	C6
I515	B7
I516	B7
I517	B8
I518	B8
I519	A8
I520	A8
I521	A4
I523	A7
I524	A7
I525	B9
I526	B9
I527	B6
I611	B7
I612	B7
I613	C7
I614	B7
I615	B7
I616	B7
I617	B7
I620	B6
I621	B6
I623	B6
I624	B7
I625	B7
I630	C6
I631	C6
I701	A3
I702	B4
I703	B4
I704	B4
I706	B3
I528	B7
I529	A8
I530	A8
I531	A8
I532	A7
I533	A8
I534	A7
I535	A7
I539	A8
I540	A8
I601	B6
I602	C8
I603	B6
I604	B6
I605	B7
I607	B4
I608	C7
I609	B6
I610	B7
I707	B4
I708	B4
I709	B4
I711	C4
I712	B4
I713	C4
I715	A9
I716	A10
I717	B4
I721	C4
I723	C7
I724	C5
I725	C5
I726	B4
I727	B4
I728	B4
I729	B4
I730	B4
I731	C4
I732	A3
I733	A3
I734	A3
I735	A3
I739	B4
I741	B3
I742	B3
I743	B4
I744	B4
I745	B4
I746	B4
I748	B4
I749	C4
I751	C5
I754	C4
I951	C9
I952	B9
I954	B9
I955	B9
I956	B9
I957	B9
I958	B9
I959	B9
I987	A10
I988	A10
I989	A10
I990	A10
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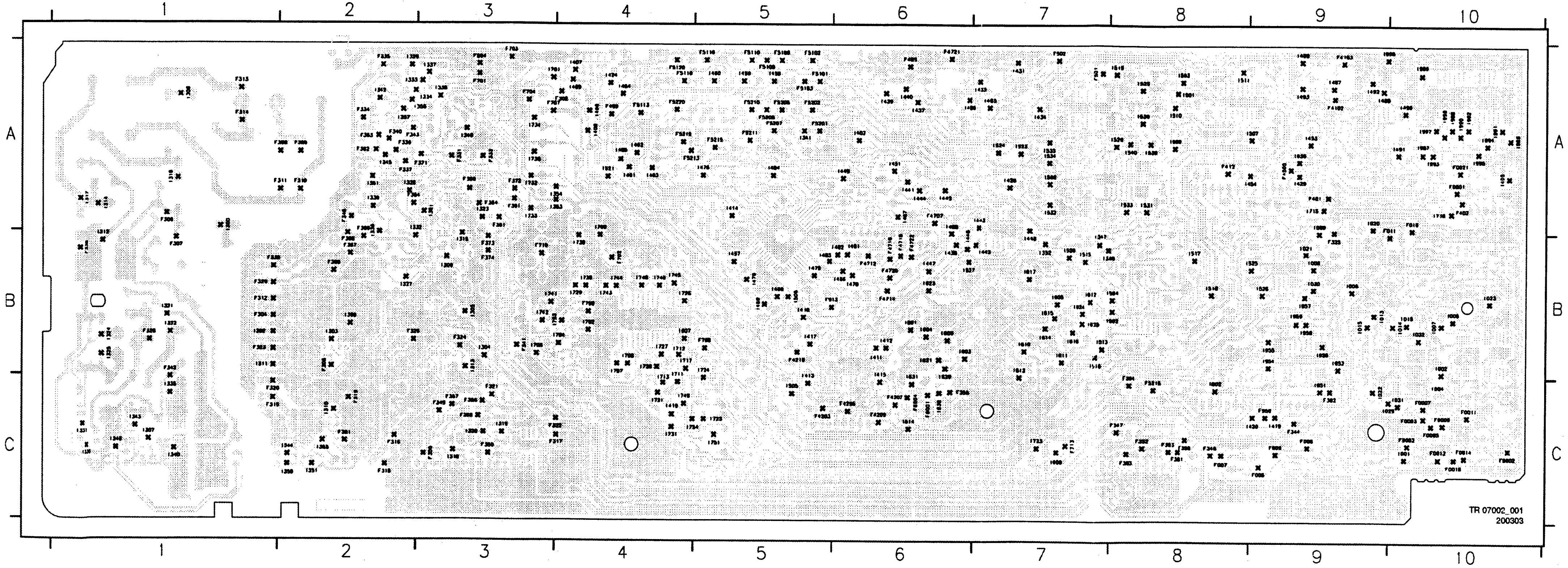
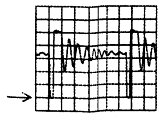
I999	A10

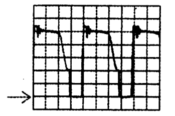


F327 VDrain (Standby)



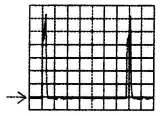
A: DC, 100V/Div
5us/Div

F327 VDrain (no disc loaded)



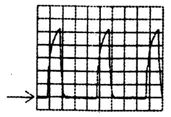
A: DC, 100V/Div
2us/Div

I324 VGate (Standby)



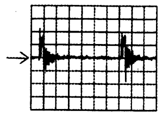
A: DC, 1V/Div
5us/Div

I324 VGate (no disc loaded)



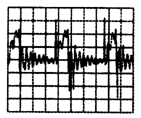
A: DC, 2V/Div
2us/Div

I324 VSource (Standby)



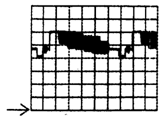
A: DC, 50mV/Div
5us/Div

I324 VSource (no disc loaded)



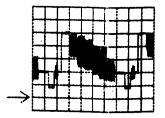
A: DC, 50mV/Div
2us/Div

F723 VFV I723



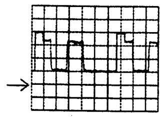
A: DC, 500mV/Div
10us/Div

E465



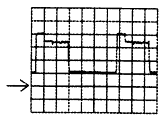
A: DC, 500mV/Div
10us/Div

E461



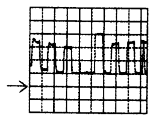
A: DC, 500mV/Div
10us/Div

E462



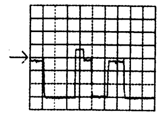
A: DC, 500mV/Div
10us/Div

E463



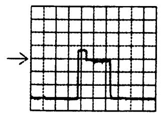
A: DC, 500mV/Div
10us/Div

D_R F4718



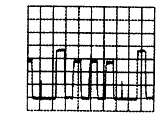
A: DC, 200mV/Div
10us/Div

D_G F4720



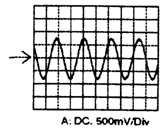
A: DC, 200mV/Div
10us/Div

D_B F4722



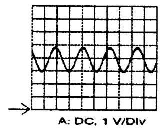
A: DC, 200mV/Div
10us/Div

ARDAC/ALDAC F010/F011



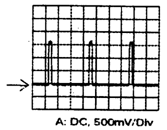
A: DC, 500mV/Div
500us/Div

I623



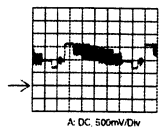
A: DC, 1 V/Div
500us/Div

SYNC F843



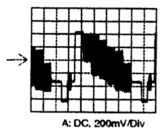
A: DC, 500mV/Div
10us/Div

A_CVBS I405



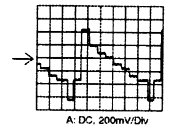
A: DC, 500mV/Div
10us/Div

D_CVBS F4712



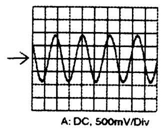
A: DC, 200mV/Div
10us/Div

D_Y F4714



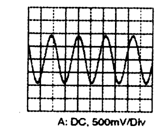
A: DC, 200mV/Div
10us/Div

I502/I504



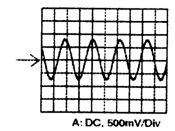
A: DC, 500mV/Div
500us/Div

I517/I518



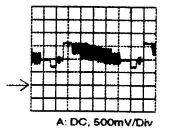
A: DC, 500mV/Div
500us/Div

F501/F502



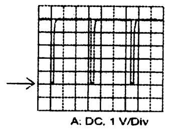
A: DC, 500mV/Div
500us/Div

A_CVBS F8008



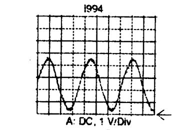
A: DC, 500mV/Div
10us/Div

I818



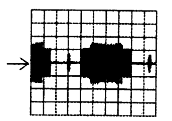
A: DC, 1 V/Div
20us/Div

I994



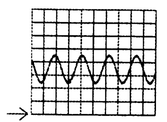
A: DC, 1 V/Div
20ns/Div

D_C F4716



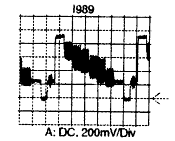
A: DC, 200mV/Div
10us/Div

I014/I032



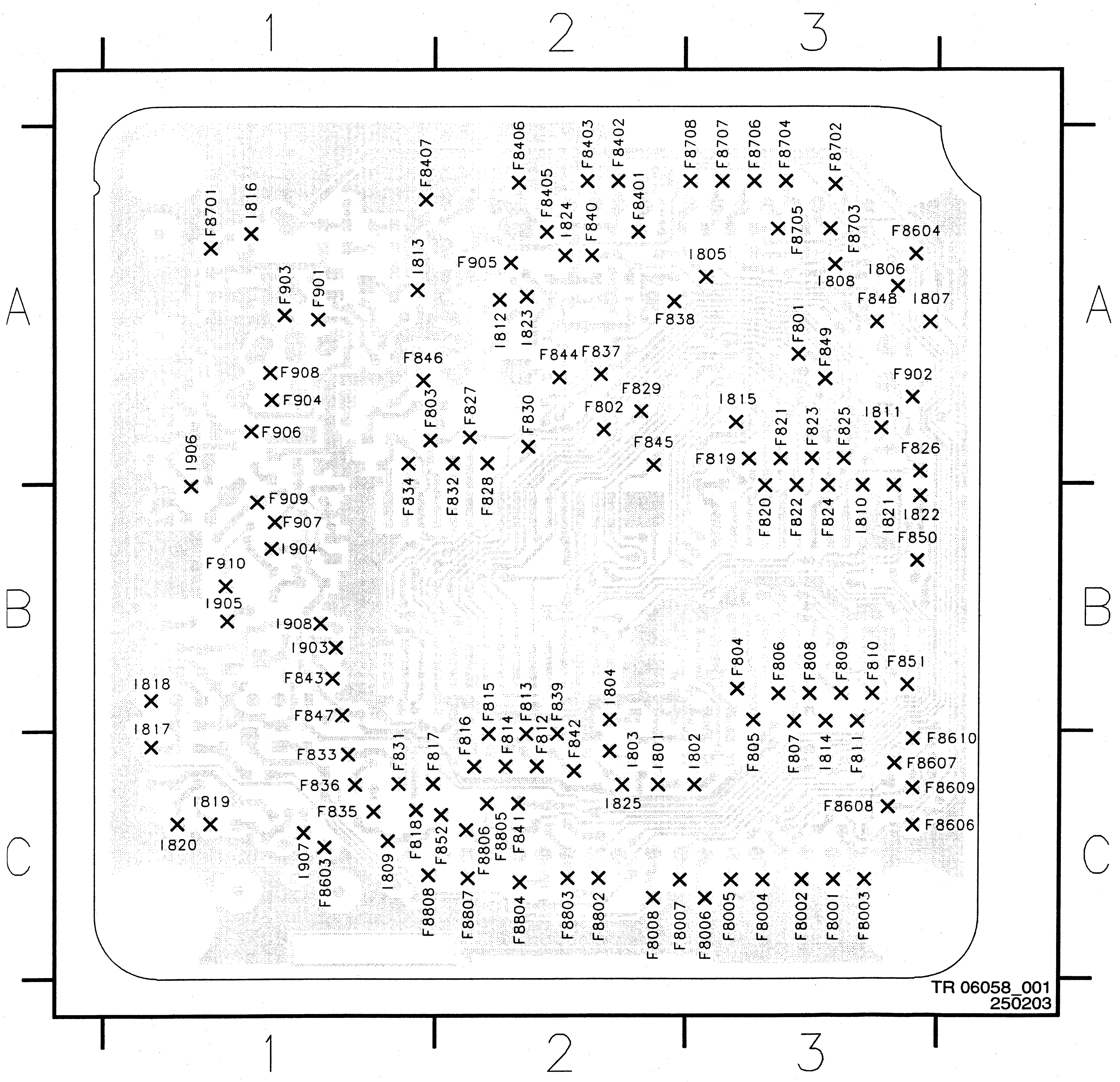
A: DC, 500mV/Div
500us/Div

I989



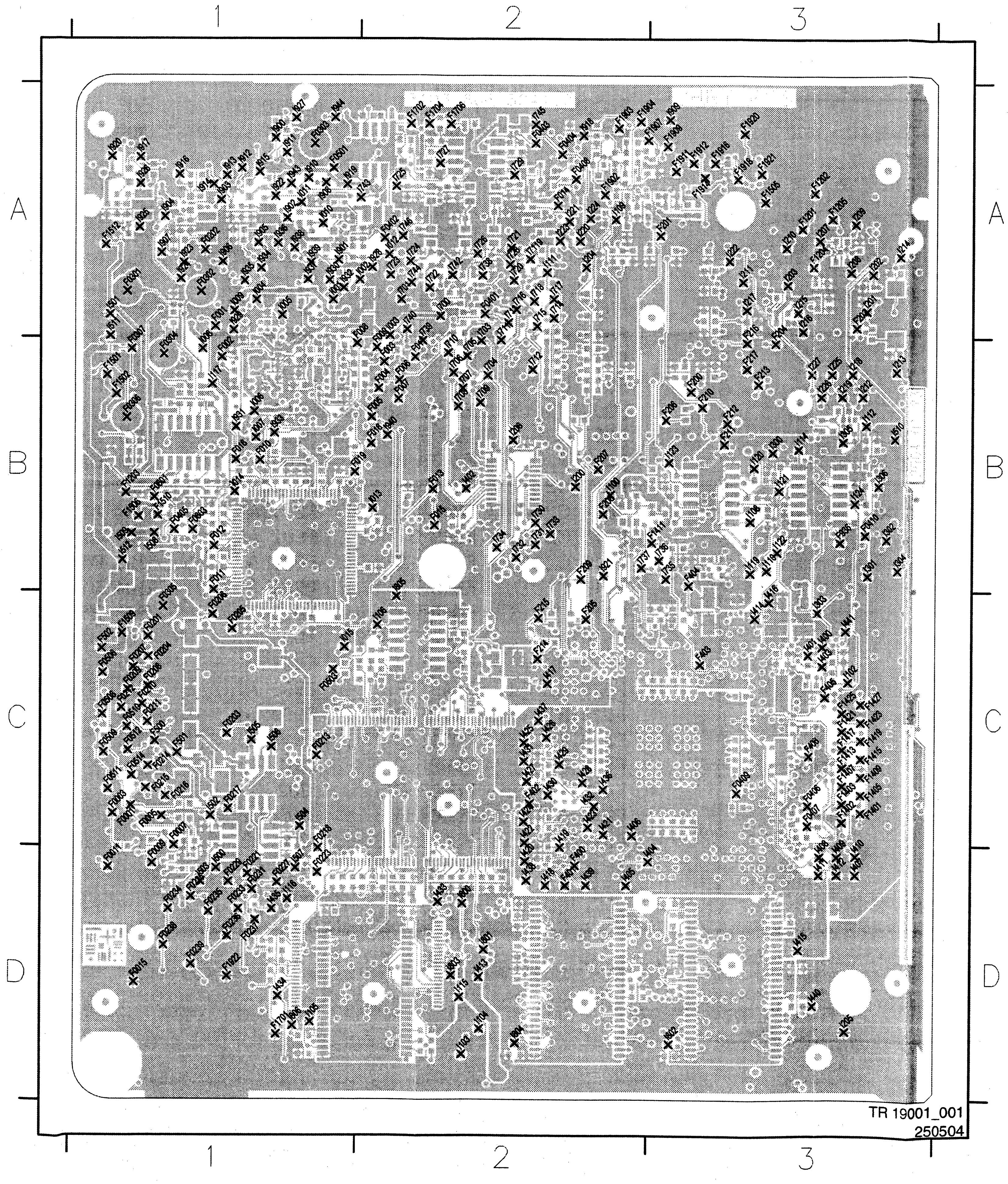
A: DC, 200mV/Div
10us/Div

Test points overview UP Sub Board



F8001	C3	F831	C1	F8610	C3	I808	A3
F8002	C3	F832	A2	F8701	A1	I809	C1
F8003	C3	F833	C1	F8702	A3	I810	B3
F8004	C3	F834	A1	F8703	A3	I811	A3
F8005	C3	F835	C1	F8704	A3	I812	A2
F8006	C3	F836	C1	F8705	A3	I813	A1
F8007	C2	F837	A2	F8706	A3	I814	B3
F8008	C2	F838	A2	F8707	A3	I815	A3
F801	A3	F839	C2	F8708	A3	I816	A1
F802	A2	F840	A2	F8802	C2	I817	C1
F803	A1	F8401	A2	F8803	C2	I818	B1
F804	B3	F8402	A2	F8804	C2	I819	C1
F805	B3	F8403	A2	F8805	C2	I820	C1
F807	B3	F8406	A2	F8806	C2	I821	B3
F812	C2	F8407	A1	F8807	C2	I822	B3
F813	C2	F841	C2	F8808	C1	I823	A2
F814	C2	F842	C2	F901	A1	I824	A2
F815	C2	F843	B1	F902	A3	I825	C2
F816	C2	F844	A2	F903	A1	I903	B1
F817	C1	F845	A2	F904	A1	I904	B1
F818	C1	F846	A1	F905	A2	I905	B1
F819	A3	F847	B1	F906	A1	I906	B1
F820	B3	F848	A3	F907	B1	I907	C1
F821	A3	F849	A3	F908	A1	I908	B1
F822	B3	F850	B3	F909	B1		
F823	A3	F851	B3	F910	B1		
F824	B3	F852	C2	I801	C2		
F825	A3	F8603	C1	I802	C3		
F826	A3	F8604	A3	I803	C2		
F827	A2	F8606	C3	I804	B2		
F828	A2	F8607	C3	I805	A3		
F829	A2	F8608	C3	I806	A3		
F830	A2	F8609	C3	I807	A3		

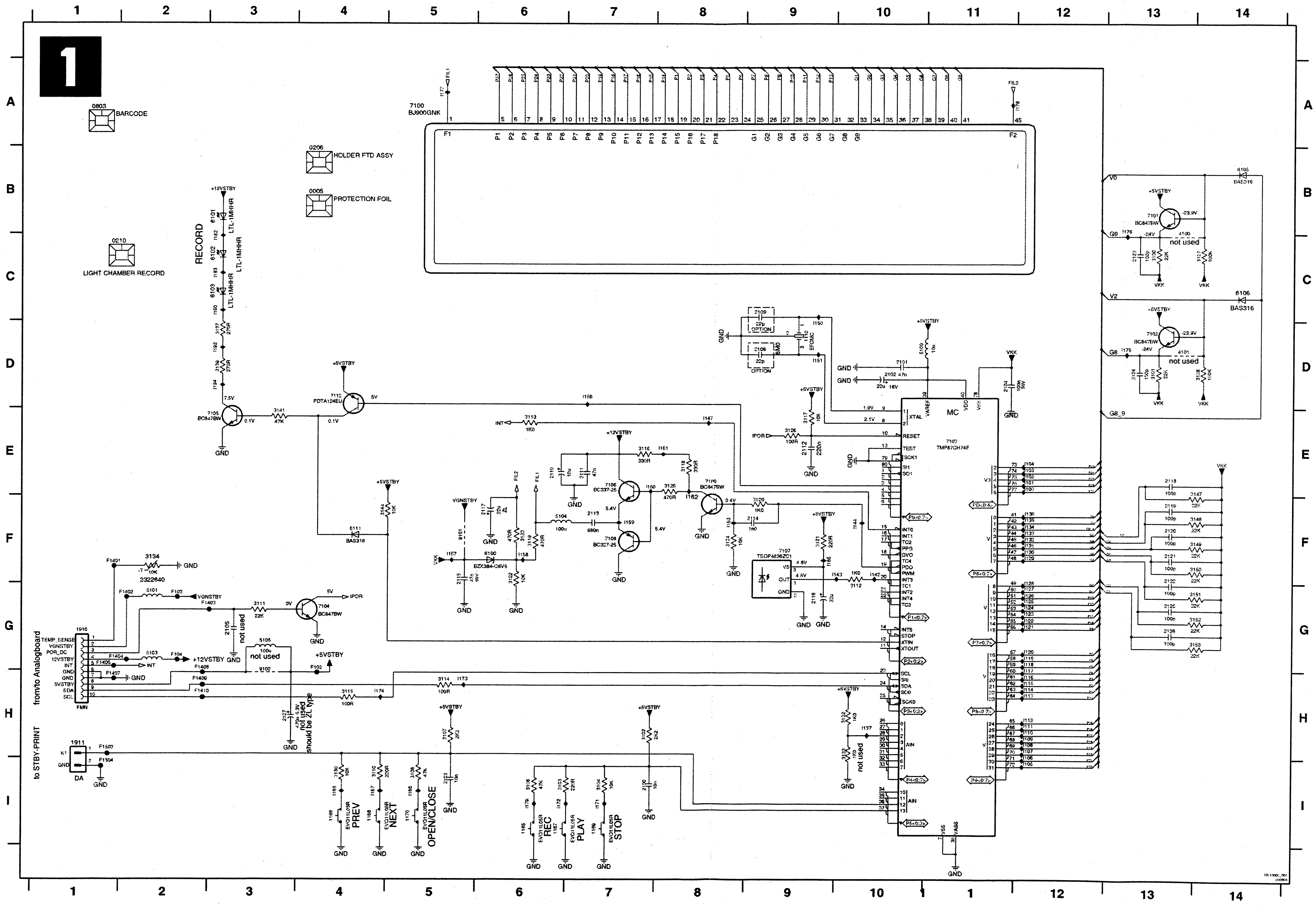
Test points overview Digital Board



F0001	C1
F0003	C1
F0005	C1
F0007	D1
F0009	D1
F001	A1
F0011	D1
F0015	D1
F002	B1
F003	B2
F004	B2
F005	B2
F006	B2
F007	B2
F008	B1
F009	B2
F010	B1
F011	C1
F012	B1
F013	B2
F014	A2
F015	B2
F016	B1
F017	B2
F018	B2
F019	B1
F0201	C1
F0202	A1
F0203	C1
F0204	C1
F0205	C1
F0206	C1
F0207	C1
F0208	C1
F0209	C1
F0210	C1
F0211	C1
F0212	C1
F0213	C1
F0214	C1
F0215	C1
F0216	C1
F0217	C1
F0218	D1
F0221	D1
F0223	D1
F0225	D1
F0227	D1
F0229	D1
F0231	D1
F0233	D1
F0234	D1
F0235	D1
F0236	D1
F0237	D1
F0238	D1
F0239	D1
F0301	A1
F0302	A1
F0303	A1
F0304	B1
F0305	C1
F0306	B1
F0307	B1
F0401	A2
F0402	A2
F0403	A2
F0404	A2
F0405	B1
F0406	C3
F0407	C3
F0408	A2
F0409	C3
F0410	B3
F0501	A1
F0503	C1
F0506	C1
F0508	C1
F0509	C1
F0510	C1
F0511	C1
F0512	C1
F0514	C1
F0601	B1
F0603	B1
F1201	A3
F1202	A3
F1203	B1
F1204	A3
F1205	A3
F1401	C3
F1402	C3
F1403	C3
F1405	C3
F1407	C3
F1409	C3
F1411	B3
F1413	C3
F1415	C3
F1417	C3
F1419	C3
F1421	C3
F1423	C3
F1425	C3
F1427	C3
F1501	B1
F1502	B1
F1505	A3
F1506	B1
F1509	C1
F1510	B1
F1512	A1
F1701	D1
F1702	A2
F1704	A2
F1706	A2
F1902	A2
F1903	A2
F1904	A2
F1907	A2
F1909	A3
F1911	A3
F1912	A3
F1914	A3
F1916	A3
F1918	A3
F1920	A3
F1921	A3
F1922	D1
F200	B3
F201	A3
F203	A3
F204	B3
F205	C2
F206	B3
F207	B2
F208	B2
F209	B2
F210	B3
F211	B3
F212	B3
F213	B3
F214	C2
F215	C2
F216	B3
F217	B3
F400	D2
F401	D2
F402	C2
F403	C3
F404	C3
F405	C3
F406	C3
F500	C1
F501	C1
F502	C1
F936	B3
I001	A1
I002	A1
I003	B2
I004	A1
I005	A1
I006	B1
I007	B1
I008	B1
I009	A1
I010	A1
I011	A1
I012	A2
I013	B2
I014	B1
I015	C1
I100	B2
I102	C3
I103	D2
I104	D2
I105	D1
I106	C2
I108	B3
I109	A2
I110	B3
I111	A2
I112	B3
I114	B3
I115	D2
I116	D1
I117	B1
I119	B3
I120	B3
I121	B3
I122	B3
I123	B3
I124	B3
I200	B2
I201	A3
I202	A3
I203	A3
I204	A2
I205	D3
I206	B2
I207	A3
I208	A3
I209	A3
I210	A3
I211	A3
I212	B3
I213	B3
I214	A3
I215	A3
I216	B3
I217	A3
I218	B3
I219	B3
I220	A2
I221	A2
I222	A3
I223	A2
I224	A2
I225	B3
I226	B3
I227	B3
I300	B3
I301	B3
I302	B3
I303	C3
I304	B3
I305	B3
I306	B3
I400	C3
I401	C3
I402	B2
I403	C3
I404	D3
I405	D2
I406	C2
I407	D3
I408	D3
I409	D3
I410	D3
I411	D3
I412	D3
I413	D2
I414	C3
I415	D3
I416	C3
I417	C2
I418	D2
I419	D2
I420	D2
I421	C2
I422	D2
I423	C2
I424	C2
I425	C2
I426	C2
I427	C2
I428	C2
I429	C2
I430	C2
I431	C2
I432	C2
I433	D2
I434	D1
I435	D1
I436	C2
I437	C2
I438	D2
I439	D2
I440	D3
I441	C3
I441	C4
I500	D1
I501	A1
I502	C1
I503	D1
I504	C1
I505	C1
I506	C1
I507	D1
I508	B1
I509	B1
I510	B3
I511	B1
I512	B1
I700	A2
I701	A2
I703	B2
I704	B2
I705	B2
I706	B2
I707	B2
I708	B2
I709	B2
I710	B2
I711	B2
I7119	A2
I712	B2
I713	A2
I714	A2
I715	A2
I716	A2
I717	A2
I718	A2
I720	A2
I721	A2
I722	A2
I723	A2
I724	A2
I725	A2
I726	A2
I727	A2
I728	A2
I729	A2
I730	B2
I731	B2
I732	B2
I733	B2
I734	B2
I735	B3
I736	B3
I737	B2
I738	A2
I739	B2
I740	B2
I742	A2
I743	A2
I743	A5
I744	A2
I744	A5
I745	A2
I745	A5
I746	A2
I746	A5
I800	D2
I801	D2
I802	D3
I803	D2
I804	D2
I805	C2
I806	D1
I900	A1
I901	A1
I902	A1
I903	A1
I904	A1
I905	A1
I906	A1
I907	A1
I908	A1
I909	A3
I910	A1
I911	A1
I912	A1
I913	A1
I914	A1
I915	A1
I916	A1
I917	A1
I918	A2
I919	A1
I920	A1
I921	B2
I922	A1
I923	A1
I924	A1
I925	A1
I926	A1
I927	A1
I928	A2
I929	B1
I930	A1
I931	B1
I932	A1
I933	B1
I934	A1
I935	A1
I936	A1
I937	A1
I938	A1
I939	A1
I940	B2
I940	B5
I943	A1
I943	A6
I944	A1
I944	A6

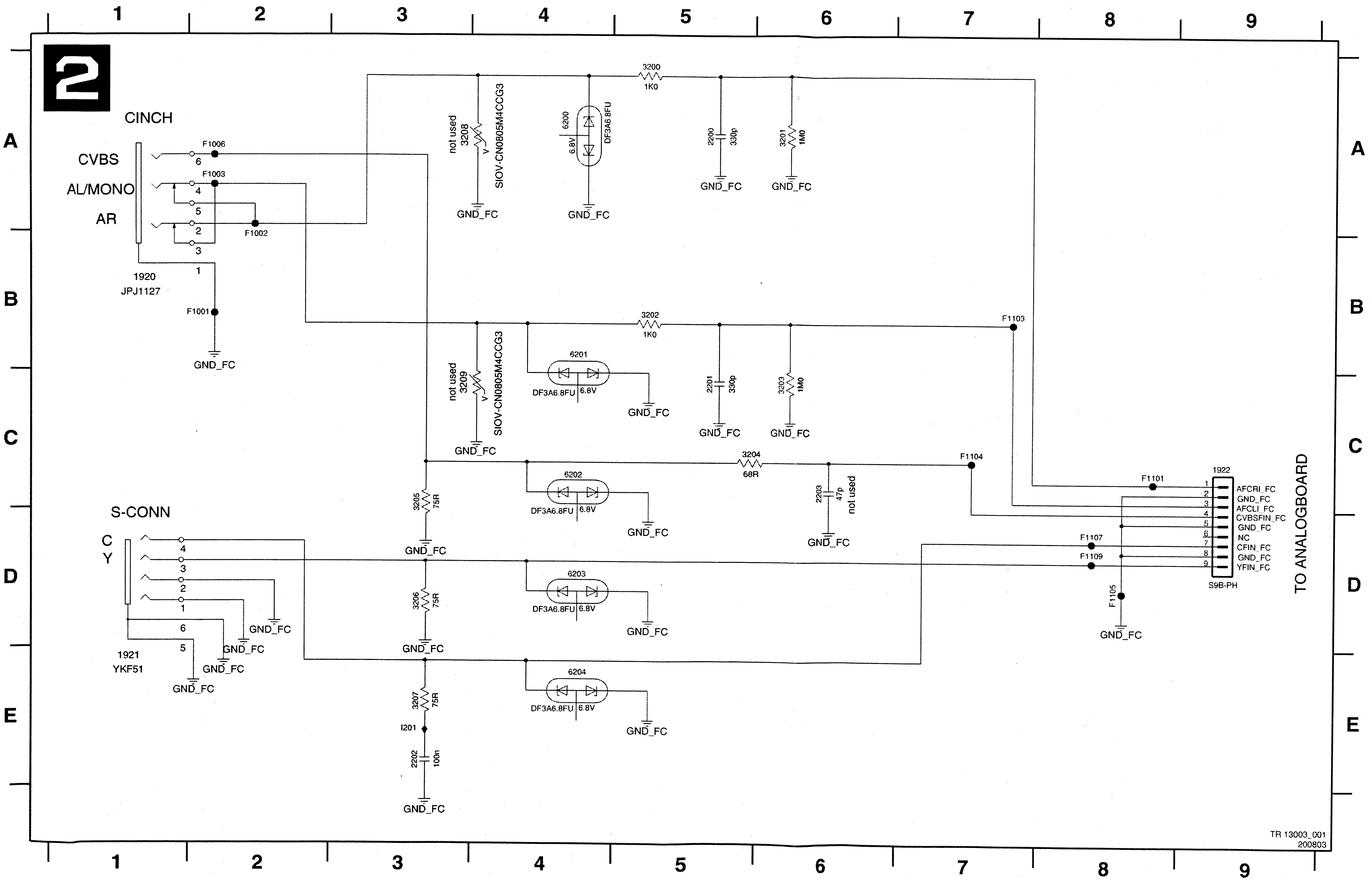
7. Circuit Diagrams and PWB Layouts

Display Panel


1
BARCODE
HOLDER FTD ASSY
PROTECTION FOIL
LIGHT CHAMBER RECORD
RECORD
LTL-1MHHR
7100
BJ900GNK
MC
7103
TMP87CH74F
XTAL
RESET
TEST
VDD
VKK
VSS
VAREF
+12VSTBY
+5VSTBY
VGNSTBY
GND
INT
IPOR
not used
BC847BW
PDTA124EU
BC337-25
BC327-25
BZX384-C6V8
BAS316
TSOP4836ZC1
from/to Analogboard
TEMP_SENSE
VGNSTBY
POR_DC
12VSTBY
INT
GND
5VSTBY
SDA
SCL
to STBY-PRINT
PREV
NEXT
OPEN/CLOSE
REC
PLAY
STOP
EVQ11L05R
should be ZL type

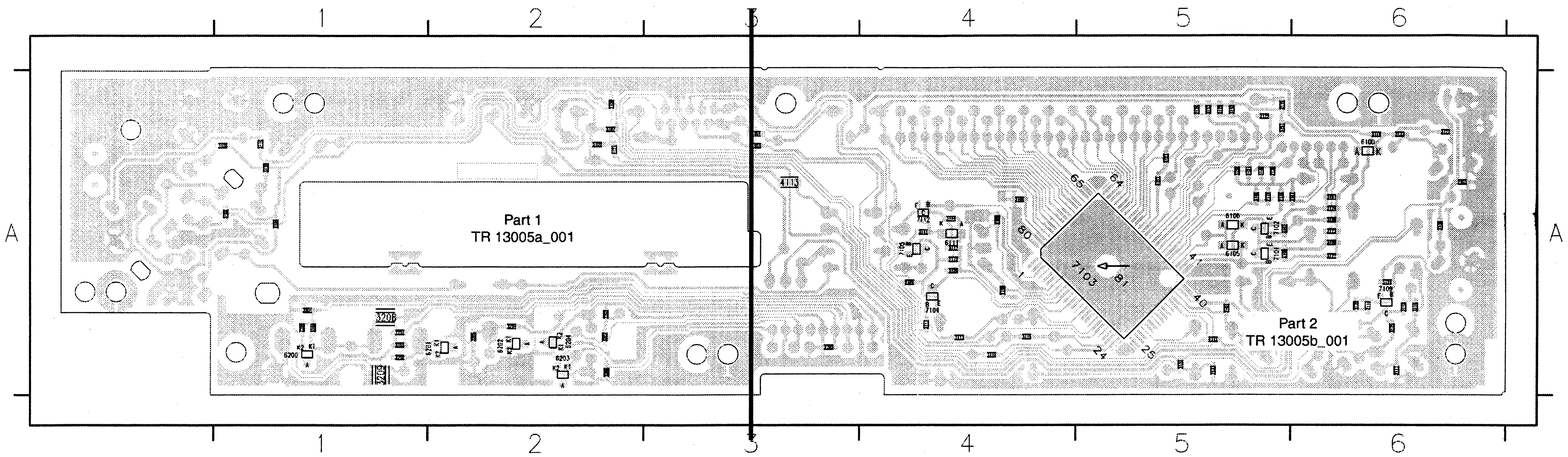
0005	B4
0206	B4
0210	C1
0803	A1
1110	D9
1165	I6
1166	I4
1167	I6
1168	I4
1169	I7
1170	I5
1910	G1
1911	H1
2100	I7
2101	D10
2102	D10
2103	I5
2104	D11
2105	G3
2108	D9
2109	C9
2110	E6
2111	E7
2112	E9
2113	F7
2114	F9
2115	F5
2116	G9
2117	F6
2118	E13
2119	F13
2120	F13
2121	F13
2122	F13
2123	C13
2124	D13
2125	G13
2126	G13
2127	H3
3100	C13
3101	D13
3102	H7
3103	I6
3104	I7
3106	I6
3107	H5
3108	I5
3110	I4
3111	G3
3112	G10
3113	E6
3114	H5
3115	H4
3116	E7
3117	E9
3118	E8
3119	F6
3120	F9
3121	F9
3122	F6
3123	F6
3124	F8
3125	E8
3126	E9
3127	C14
3128	D14
3130	I4
3132	H10
3133	H10
3134	F2
3137	D3
3139	D3
3141	E3
3144	F4
3147	E14
3148	F14
3149	F14
3150	F14
3151	G14
3152	G14
3153	G14
4100	C13
4101	D13
5100	D10
5101	G2
5103	G2
5104	F6
5105	G3
6100	F6
6101	B3
6102	C3
6103	C3
6105	B14
6106	C14
6111	F4
7100	A5
7101	B13
7102	D13
7103	E11
7104	G4
7105	E3
7106	E7
7107	F9
7108	F7
7109	E8
7112	D4
9101	F5
F102	G4
F103	G2
F104	G2
F1401	F1
F1402	G2
F1403	G3
F1404	G1
F1405	G1
F1407	H1
F1408	G2
F1409	H2
F1410	H2
F1503	H1
F1504	I1
I100	E12
I101	E12
I102	E12
I103	E12
I104	E12
I105	I12
I106	H12
I107	H12
I108	H12
I109	H12
I110	H12
I111	H12
I112	H12
I113	H12
I114	H12
I115	H12
I116	H12
I117	G12
I118	G12
I119	G12
I120	G12
I121	G12
I122	G12
I123	G12
I124	G12
I125	G12
I126	G12
I127	G12
I128	F12
I129	F12
I130	F12
I131	F12
I132	F12
I133	F12
I134	F12
I135	F12
I136	F12
I137	H10
I142	F10
I143	F10
I144	F10
I147	E8
I150	D9
I151	D9
I156	D7
I157	F5
I158	F6
I159	F7
I160	E7
I161	E8
I162	F8
I163	F8
I165	F9
I166	I5
I167	I4
I168	I4
I171	I7
I172	I6
I173	H5
I174	H4
I175	D13
I176	B13
I177	A5
I178	A11
I179	I6
I182	C3
I183	C3
I190	C3
I192	D3
I194	D3

Front Connector (FC)


2
CINCH
CVBS
AL/MONO
AR
1920
JPJ1127
F1006
F1003
F1002
F1001
GND_FC
not used
3208
SIOV-CN0805M4CCG3
6200
6.8V
DF3A6.8FU
3200
1K0
2200
330p
3201
1M0
3202
1K0
not used
3209
SIOV-CN0805M4CCG3
6201
DF3A6.8FU
6.8V
2201
330p
3203
1M0
F1103
3204
68R
F1104
2203
47p
not used
6202
DF3A6.8FU
6.8V
3205
75R
S-CONN
C
Y
1921
YKF51
3206
75R
6203
DF3A6.8FU
6.8V
3207
75R
I201
2202
100n
6204
DF3A6.8FU
6.8V
F1101
F1107
F1109
F1105
1922
AFCRI_FC
GND_FC
AFCLI_FC
CVBSFIN_FC
GND_FC
NC
CFIN_FC
GND_FC
YFIN_FC
S9B-PH
TO ANALOGBOARD
TR 13003_001
200803
1 2 3 4 5 6 7 8 9
A B C D E

1920	B1
1921	E1
1922	C9
2200	A5
2201	C5
2202	E3
2203	C6
3200	A5
3201	A6
3202	B5
3203	C6
3204	C5
3205	C3
3206	D3
3207	E3
3208	A3
3209	C3
6200	A4
6201	B4
6202	C4
6203	D4
6204	E4
F1001	B2
F1002	B2
F1003	A2
F1006	A2
F1101	C8
F1103	C8
F1104	C8
F1105	C8
F1107	D8
F1109	D8
I201	E3

Layouts Display Panel


1
2
3
4
5
6
A
Part 1
TR 13005a_001
Part 2
TR 13005b_001

2100	A2
2101	A5
2103	A6
2104	A4
2105	A4
2108	A4
2109	A4
2111	A6
2112	A4
2114	A6
2115	A5
2118	A5
2119	A5
2120	A5
2121	A5
2122	A5
2123	A6
2124	A6
2125	A5
2126	A5
2200	A1
2201	A1
2202	A2
2203	A3
3100	A6
3101	A6
3102	A2
3103	A1
3104	A1
3106	A1
3107	A2
3108	A5
3110	A1
3111	A4
3113	A4
3114	A4
3115	A4
3116	A6
3117	A4
3118	A6
3119	A6
3120	A6
3122	A6
3123	A6
3124	A6
3125	A6
3126	A4
3127	A6
3128	A6
3130	A1
3132	A5
3133	A5
3141	A4
3144	A4
3147	A6
3148	A5
3149	A5
3150	A5
3151	A5
3152	A5
3153	A5
3200	A1
3201	A1
3202	A1
3203	A1
3204	A2
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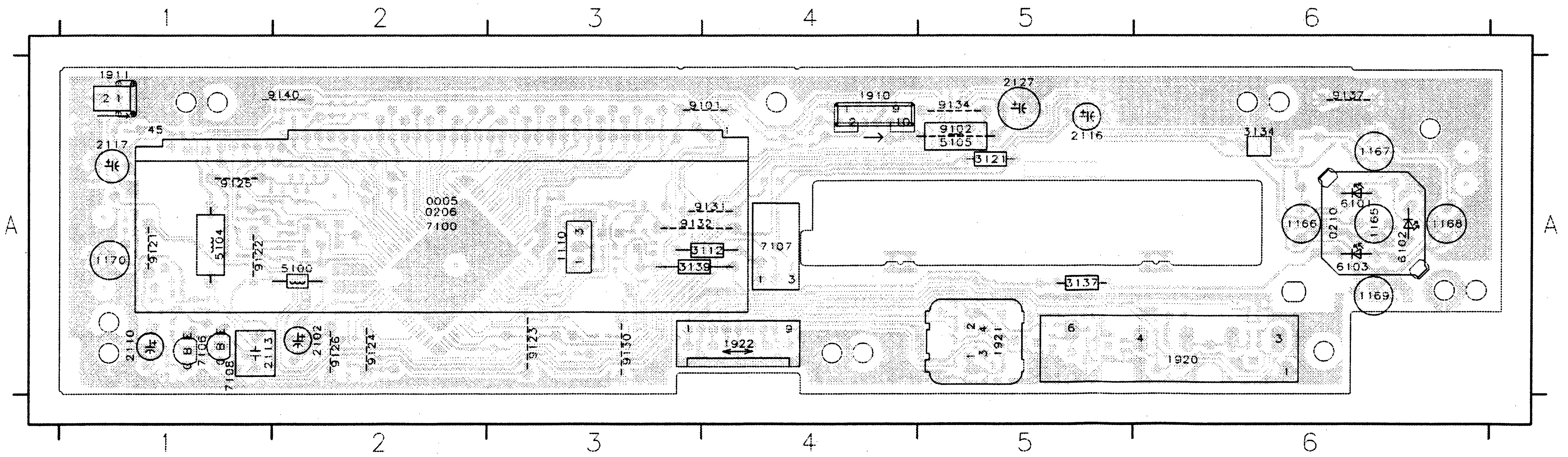
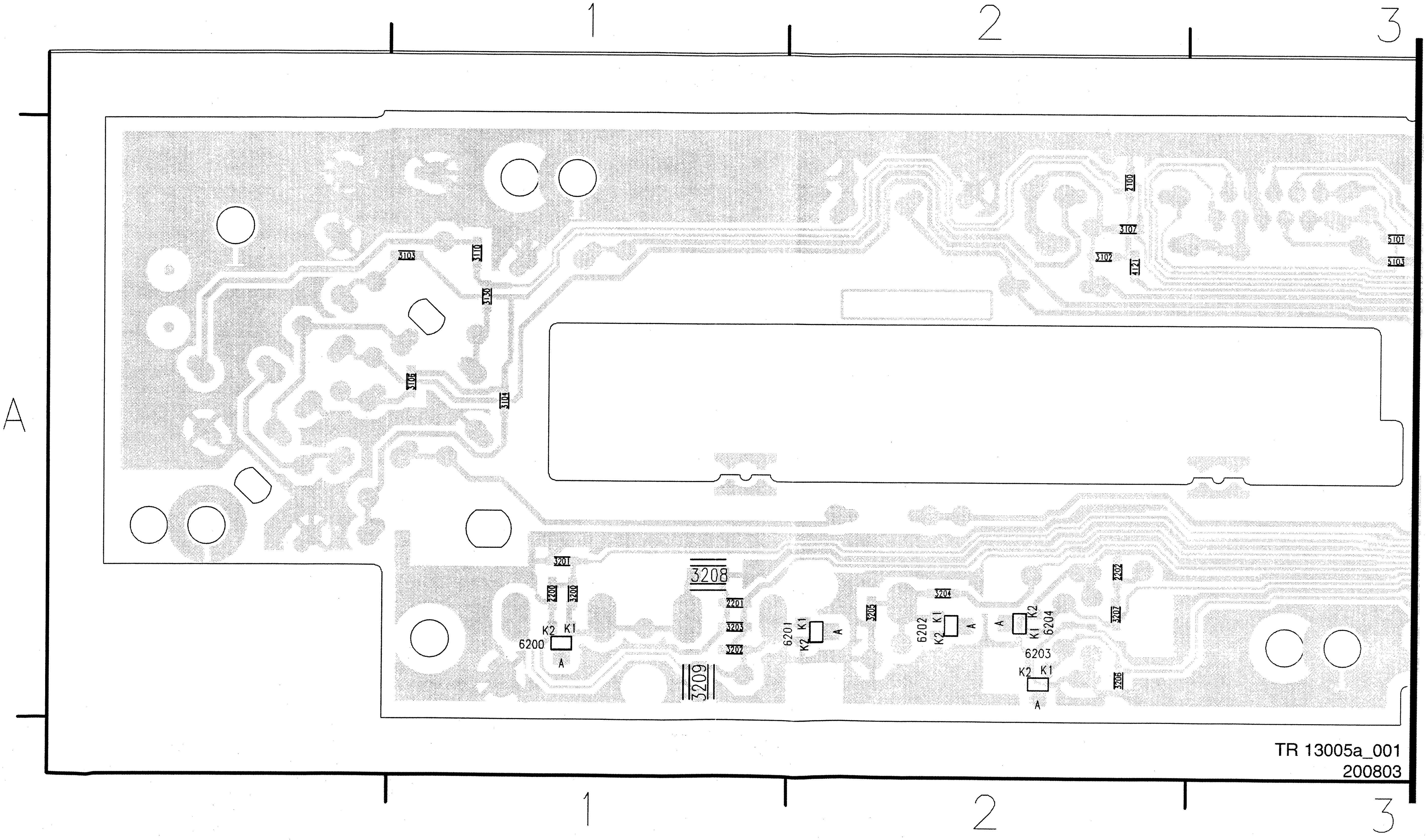
3206	A2
3207	A2
3208	A1
3209	A1
4100	A5
4101	A5
4112	A5
4113	A3
4121	A2
4122	A5
4123	A5
5101	A3
5103	A3
6100	A6
6105	A5
6106	A5
6111	A4
6200	A1
6201	A2
6202	A2
6203	A2
6204	A2
7101	A5
7102	A5
7103	A5
7104	A4
7105	A4
7109	A6
7112	A4


1
2
3
4
5
6
A
1911
9140
9101
1910
9134
2127
2116
9137
3134
1167
2117
45
9125
0005
0206
7100
9131
9132
3112
3139
1110
7107
9102
5105
3121
6101
1166
0210
1165
6102
1168
6103
3137
1169
1170
9121
5104
9127
5100
2110
7106
7108
2113
2102
9126
9124
9123
9130
1922
1921
1920

0005	A2
0206	A2
0210	A6
1110	A3
1165	A6
1166	A6
1167	A6
1168	A6
1169	A6
1170	A1
1910	A4
1911	A1
1920	A6
1921	A5
1922	A4
2102	A2
2110	A1
2113	A1
2116	A5
2117	A1
2127	A5
3112	A4
3121	A5
3134	A6
3137	A5
3139	A3
5100	A2
5104	A1
5105	A5
6101	A6
6102	A6
6103	A5
7100	A2
7106	A1
7107	A4
7108	A1
9101	A4
9102	A5
9121	A1
9122	A1
9123	A3
9124	A2
9125	A1
9126	A2
9130	A3
9131	A4
9132	A3
9134	A5
9137	A6
9140	A2

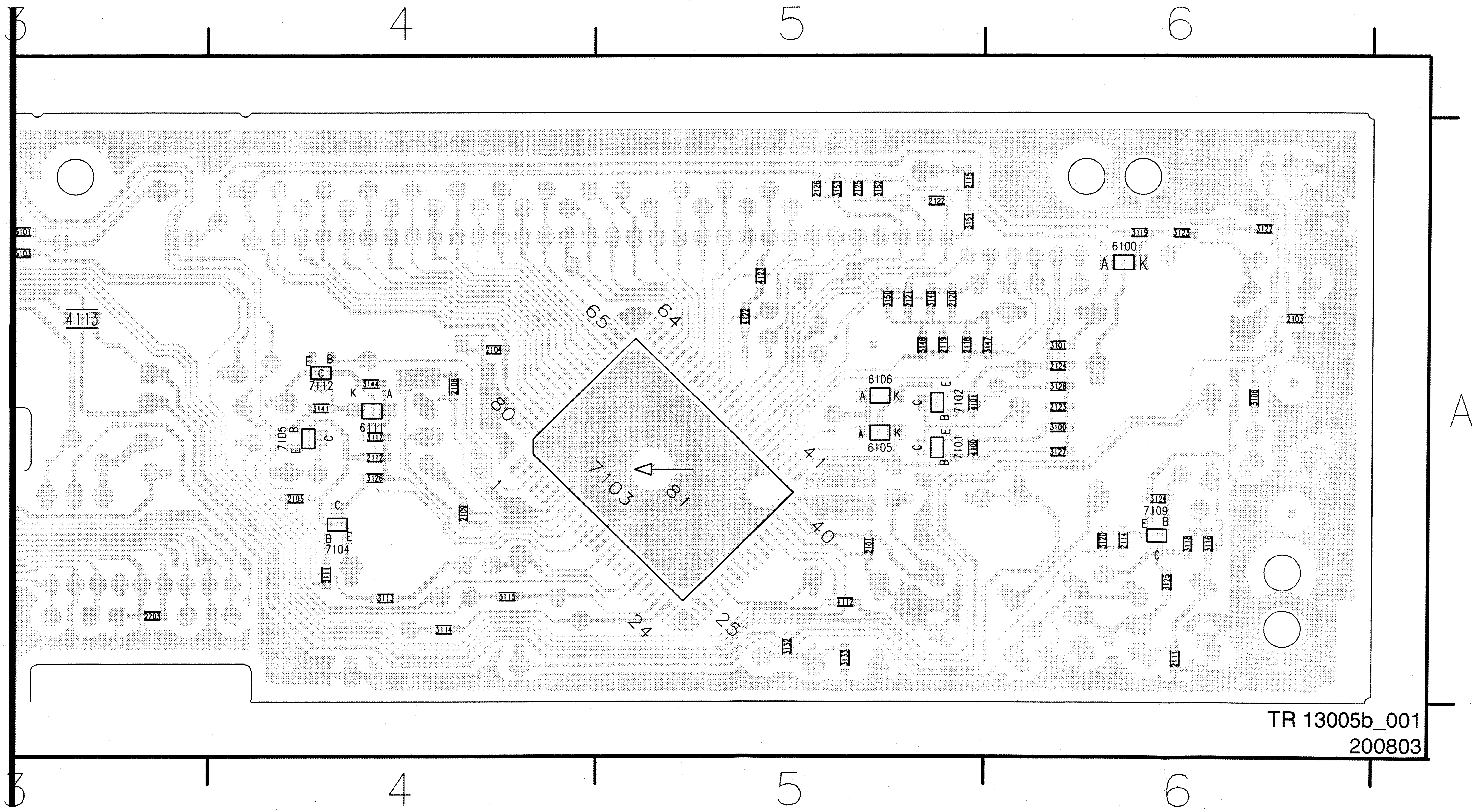
TR 13005_001
200803

Layout Display Panel (Part 1 Bottom View)


1
2
3
A
3103
3110
3130
3106
3104
2100
3107
3101
3102
4121
3103
3201
2200
3200
3208
2201
3203
3202
3209
3205
3204
2202
3207
3206
6200
K2
K1
A
6201
6202
6203
6204
1
2
3

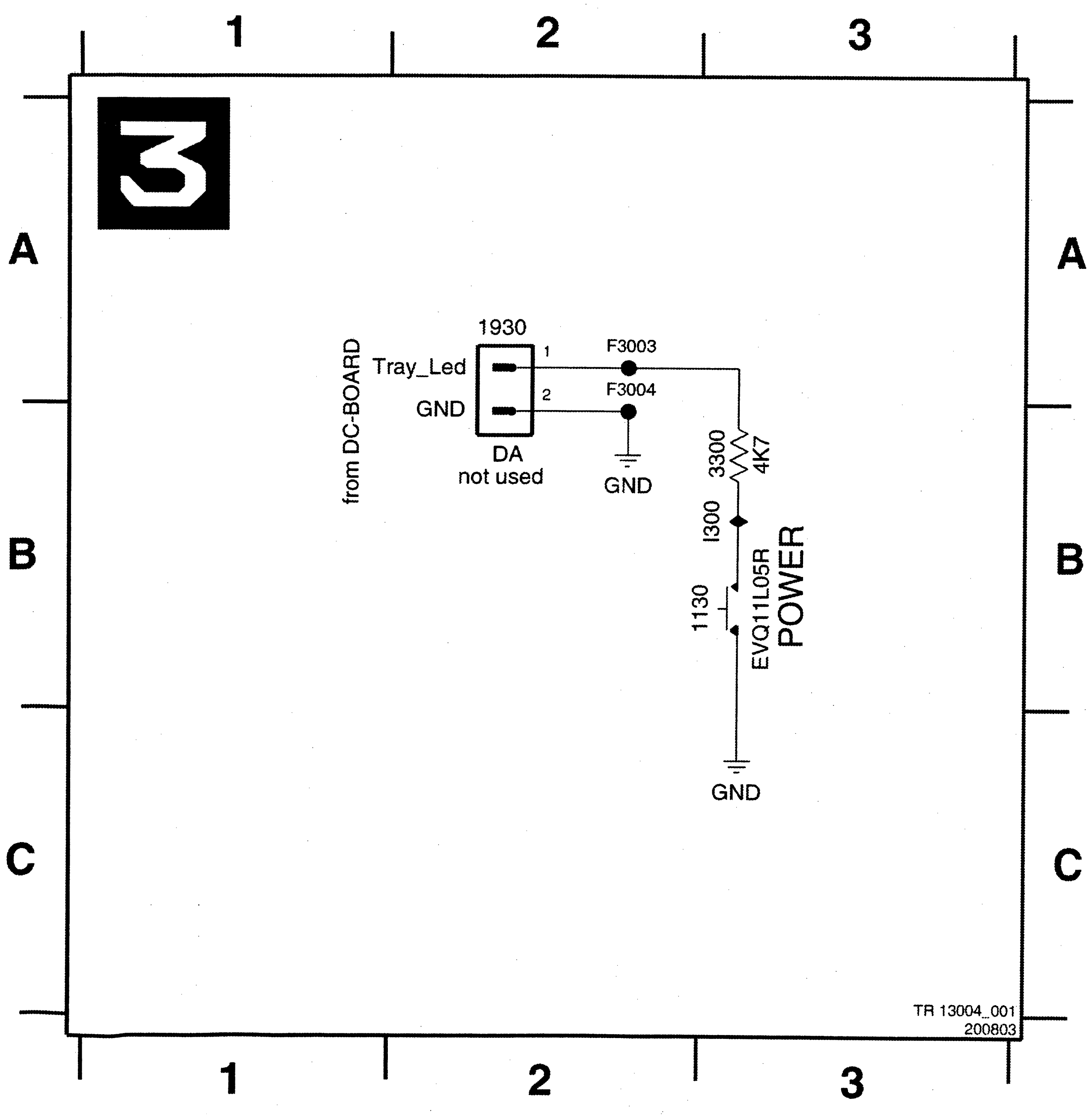
TR 13005a_001
200803

Layout Display Panel (Part 2 Bottom View)

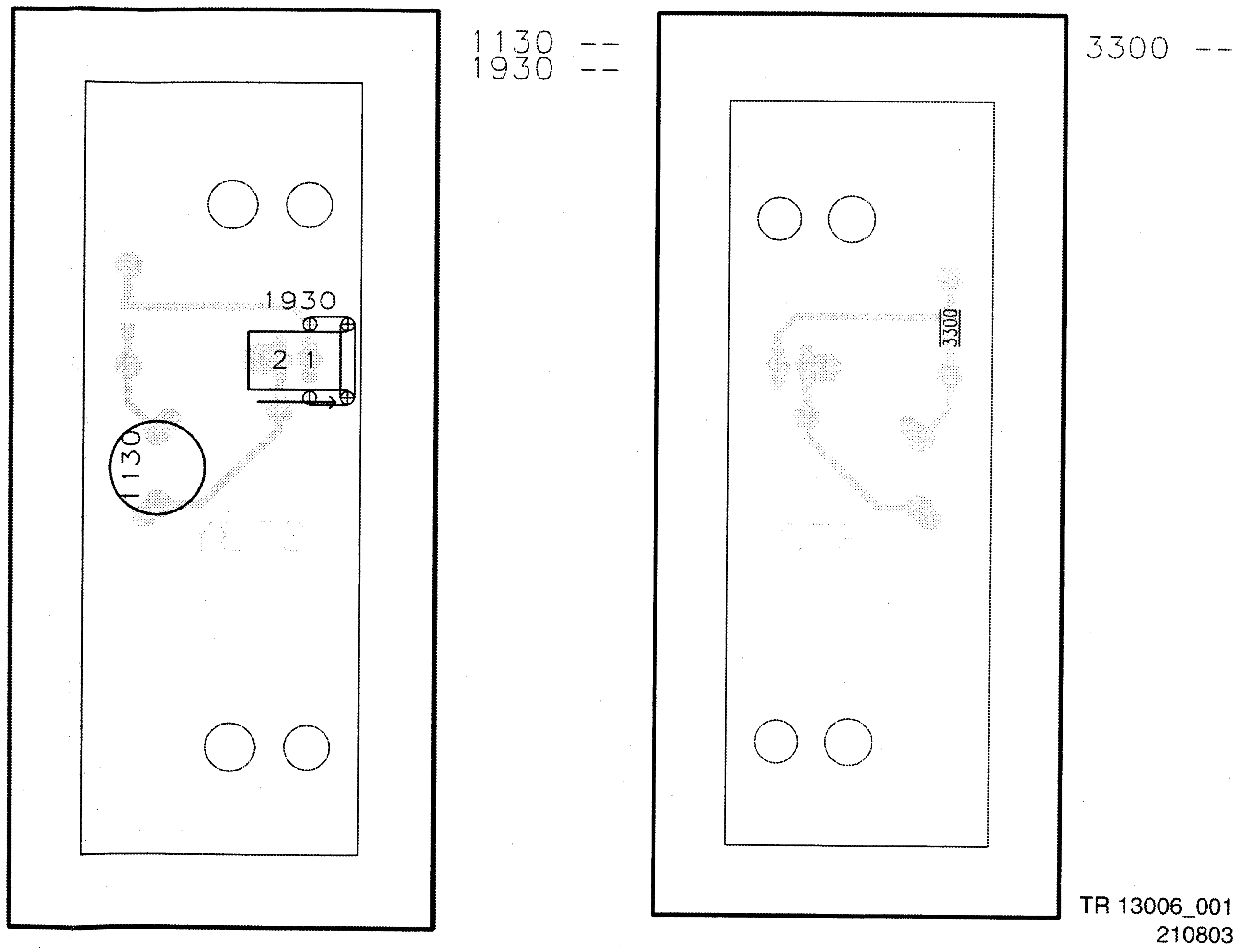

3
4
5
6
A
4113
7112
6111
7105
7104
7103
6106
6105
7102
7101
6100
7109
65
64
80
81
1
41
40
24
25
A
K
B
C
E
2104
2105
2203
3141
3144
3117
2112
3126
3111
3113
3114
3115
2122
3101
2124
3100
3127
2103
3112
TR 13005b_001
200803

Standby Panel (STBY)

1130	B3
1930	A2
3300	B3
F3003	A2
F3004	A2
I300	B3

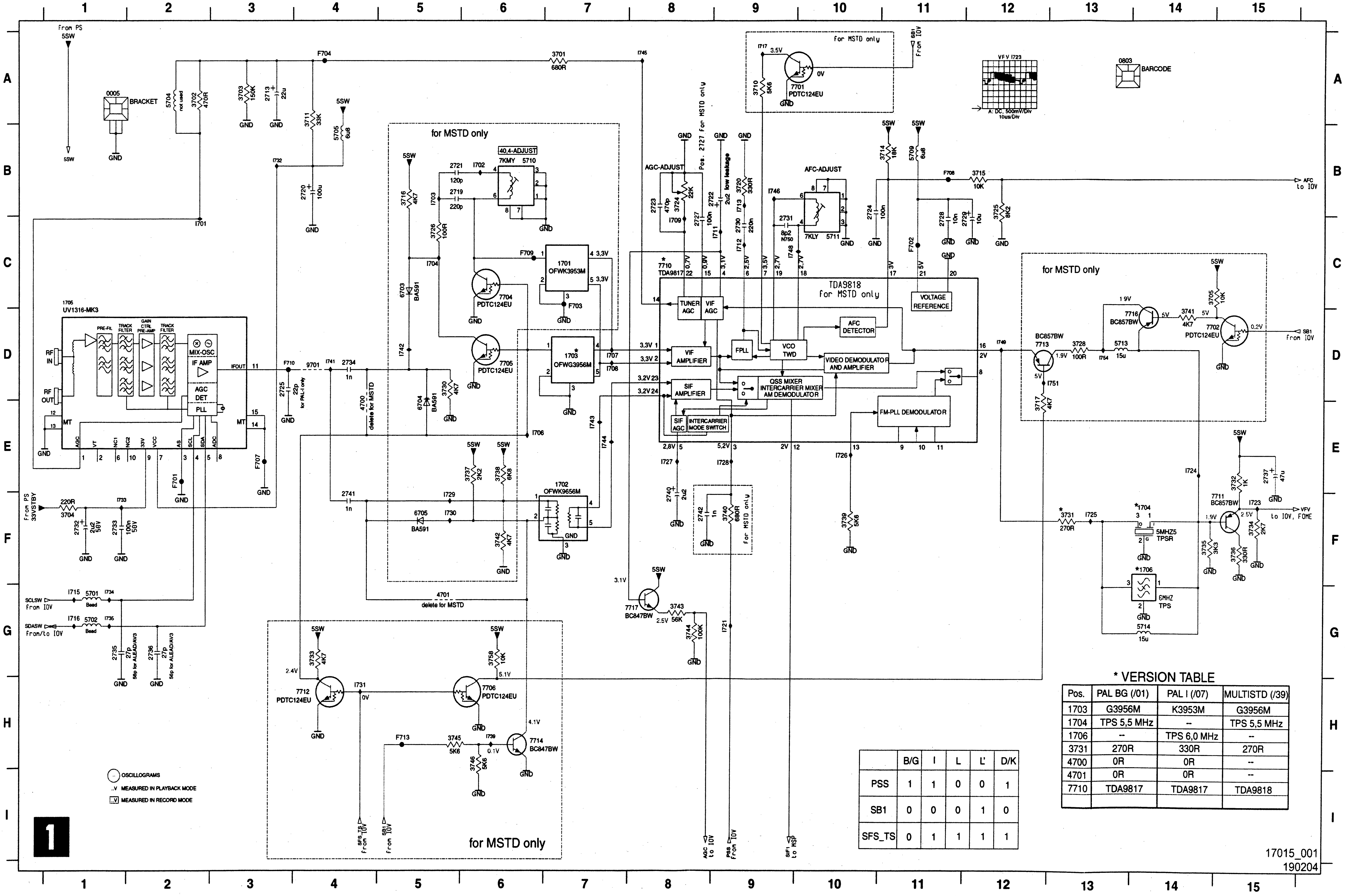

1
2
3
A
B
C
3
1930
Tray_Led
GND
1
2
F3003
F3004
from DC-BOARD
DA
not used
GND
3300
4K7
I300
1130
EVQ11L05R
POWER
GND
TR 13004_001
200803

Layout Standby Panel


1130 --
1930 --
1930
2 1
1130
3300 --
3300
TR 13006_001
210803

Analog Board: Frontend Video (FV)

0005	A1
0803	A13
1701	C7
1702	E7
1703	D7
1704	F14
1705	C1
1706	F14
2713	A3
2719	B5
2720	B4
2721	B5
2722	B8
2723	B8
2724	B10
2725	D3
2727	C8
2728	C11
2729	C12
2730	C9
2731	C9
2732	F1
2733	F1
2734	D4
2735	G1
2736	G2
2737	E15
2740	F8
2741	F4
2742	F8
3701	A7
3702	A2
3703	A3
3704	F1
3705	C14
3710	A9
3711	A4
3714	B11
3715	B12
3716	B5
3717	E12
3720	B9
3724	B8
3725	B12
3726	C5
3728	D13
3730	D5
3731	F13
3732	E15
3733	G4
3734	F15
3735	F14
3736	F15
3737	E6
3738	E6
3739	F10
3740	F9
3741	D14
3742	F6
3743	G8
3744	G8
3745	H5
3746	H6
3758	G6
4700	E4
4701	G5
5701	G1
5702	G1
5704	A2
5705	B4
5709	B11
5710	B6
5711	C10
5713	D13
5714	G14
6703	C5
6704	E5
6705	F5
7701	A10
7702	D15
7704	C6
7705	D6
7706	H6
7710	C8
7711	F14
7712	H4
7713	D12
7714	H6
7716	D14
7717	G7
9701	D4
F701	E2
F702	C11
F703	D7
F704	A4
F707	E3
F708	B11
F709	C6
F710	D3
F713	H5
I701	C2
I702	B6
I703	B5
I704	C5
I706	E6
I707	D7
I708	D7
I709	C8
I711	C9
I712	C9
I713	B9
I715	G1
I716	G1
I717	A9
I721	G9
I723	F15
I724	E14
I725	F13
I726	E10
I727	E8
I728	E9
I729	F5
I730	F5
I731	H4
I732	B3
I733	F1
I734	G1
I735	G1
I739	H6
I741	D4
I742	D5
I743	E7
I744	E7
I745	A8
I746	B9
I748	C9
I749	D12
I751	D13
I754	D13

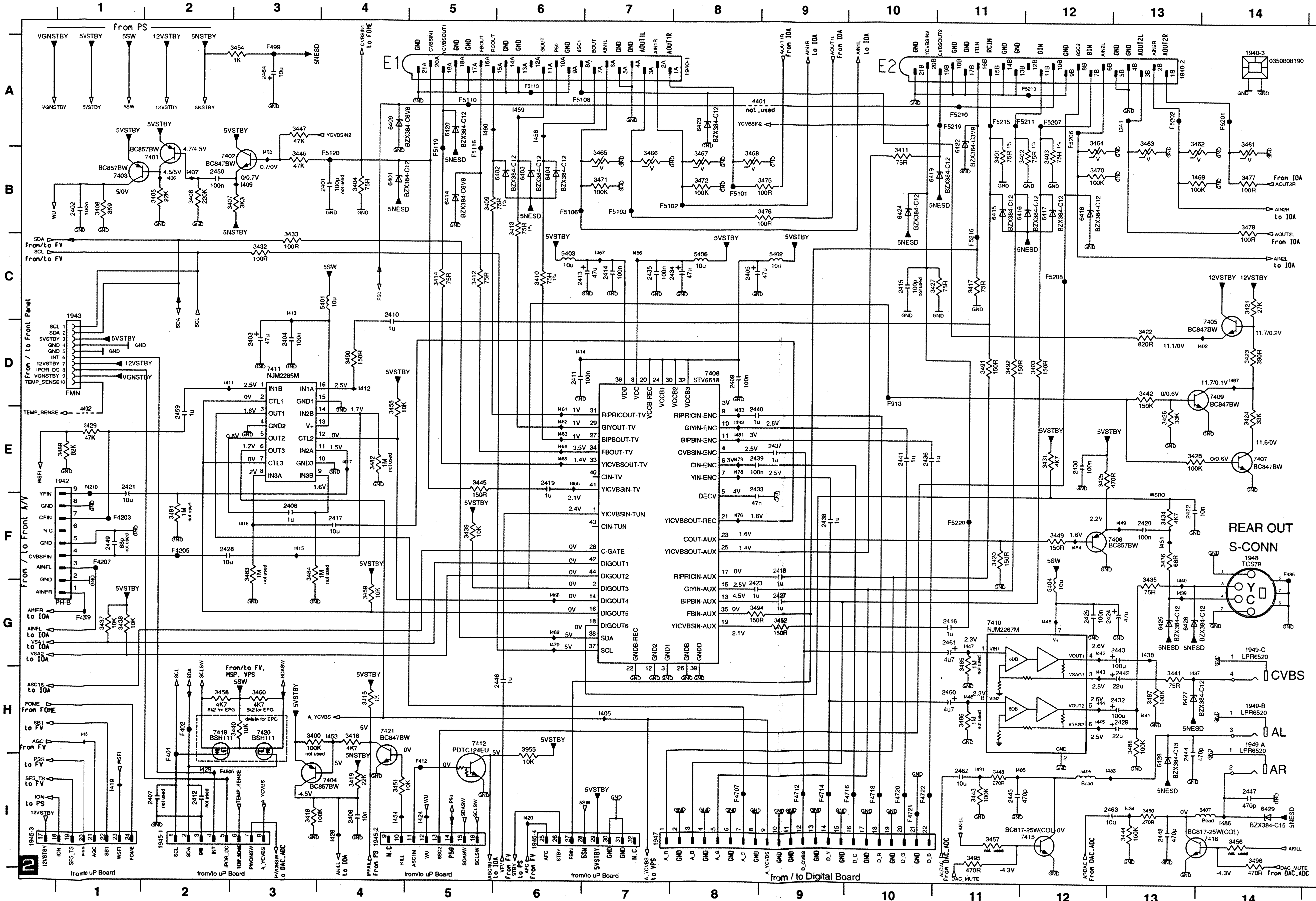

From PS
5SW
F704
3701
680R
I745
0005
BRACKET
5704
not used
3702
470R
3703
150K
2713
22u
3711
33K
5SW
5705
6u8
2720
100u
I732
I701
I705
UV1316-MK3
PRE-FIL
TRACK FILTER
GAIN CTRL PRE-AMP
TRACK FILTER
MIX-OSC
IF AMP
AGC DET
PLL
IFOUT
RF IN
RF OUT
MT
AGC
VT
NC1
NC2
33V
VCC
AS
SCL
SDA
ADC
F710
9701
I741
2734
1n
2725
22p
for PAL-I only
4700
delete for MSTD
F701
F707
From PS
33VSTBY
220R
3704
I733
2732
2u2
50V
2733
100n
50V
SCLSW
From IOV
I715
5701
Bead
I734
SDASW
From/to IOV
I716
5702
Bead
I735
2735
27p
56p for ALEAD/AV3
2736
27p
56p for ALEAD/AV3
for MSTD only
5SW
3716
4K7
2721
120p
I702
2719
220p
40,4-ADJUST
7KMY 5710
I703
3726
100R
I704
6703
BA591
7704
PDTC124EU
7705
PDTC124EU
I742
6704
BA591
3730
4K7
F709
1701
OFWK3953M
3,3V
F703
1703
OFWG3956M
I707
I708
I706
2741
1n
6705
BA591
I729
I730
3737
2K2
3738
6K8
3742
4K7
1702
OFWK9656M
4701
delete for MSTD
I743
I744
5SW
3733
4K7
2.4V
7712
PDTC124EU
I731
0V
3758
10K
5.1V
7706
PDTC124EU
4.1V
F713
3745
5K6
I739
0.1V
7714
BC847BW
3746
5K6
SFS_TS
From IOV
SB1
From IOV
GND
OSCILLOGRAMS
..V MEASURED IN PLAYBACK MODE
..V MEASURED IN RECORD MODE
For MSTD only
I717
3.5V
3710
5K6
7701
PDTC124EU
0V
SB1
From IOV
AGC-ADJUST
2723
47p
3724
22K
I709
2727
100n
Pos. 2727 For MSTD only
2722
2u2 low leakage
3720
330R
I713
I711
I712
2730
220n
AFC-ADJUST
I746
2731
8p2
N750
7KLY 5711
I748
*
7710
TDA9817
TDA9818
For MSTD only
TUNER AGC
VIF AGC
VIF AMPLIFIER
SIF AMPLIFIER
FPLL
VCO TWD
AFC DETECTOR
VOLTAGE REFERENCE
VIDEO DEMODULATOR AND AMPLIFIER
QSS MIXER INTERCARRIER MIXER AM DEMODULATOR
FM-PLL DEMODULATOR
SIF AGC
INTERCARRIER MODE SWITCH
I727
2740
2u2
I728
2742
1n
3740
680R
For MSTD only
I726
3739
5K6
5SW
3.1V
7717
BC847BW
2.5V
3743
56K
3744
100K
I721
AGC
to IOV
PSS
From IOV
SIF1
to MSP
5SW
3714
18K
5SW
5709
6u8
F708
3715
10K
AFC
to IOV
2724
100n
F702
2728
10n
2729
10u
3725
8K2
VFV I723
A: DC, 500mV/Div
10us/Div
0803
BARCODE
for MSTD only
5SW
3705
10K
1.9V
7716
BC857BW
5V
3741
4K7
7702
PDTC124EU
0.2V
SB1
From IOV
I749
BC857BW
7713
1.9V
3728
100R
I754
5713
15u
I751
3717
4K7
5SW
I724
3732
1K
2737
47u
7711
BC857BW
I723
VFV
to IOV, FOME
3731
270R
I725
*1704
5MHZ5
TPSR
*1706
6MHZ
TPS
5714
15u
3735
3K3
3736
330R
3734
2K7
17015_001
190204

	B/G	I	L	L'	D/K
PSS	1	1	0	0	1
SB1	0	0	0	1	0
SFS_TS	0	1	1	1	1

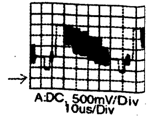
* VERSION TABLE

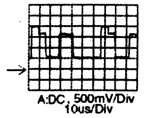
Pos.	PAL BG (/01)	PAL I (/07)	MULTISTD (/39)
1703	G3956M	K3953M	G3956M
1704	TPS 5,5 MHz	--	TPS 5,5 MHz
1706	--	TPS 6,0 MHz	--
3731	270R	330R	270R
4700	0R	0R	--
4701	0R	0R	--
7710	TDA9817	TDA9817	TDA9818

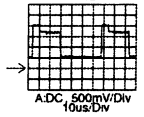
Analog Board: In/Out Video (IOV)

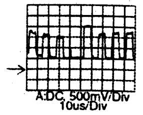

from PS
VGNSTBY
5VSTBY
5SW
12VSTBY
5NSTBY
E1
E2
1940-1
1940-2
1940-3
0350808190
7401 BC857BW
7402 BC847BW
7403 BC847BW
7411 NJM2285M
7406 STV6618
7405 BC847BW
7409 BC847BW
7407 BC847BW
7406 BC857BW
7410 NJM2267M
7404 BC857BW
7421 BC847BW
7412 PDTC124EU
7419 BSH111
7420 BSH111
7415 BC817-25W(COL)
7416 BC817-25W(COL)
1943 FMN
1942 PH-B
SDA from/to FV
SCL from/to FV
from / to Front Panel
from / to Front A/V
REAR OUT
S-CONN
1948 TCS79
1949-C LPR6520
CVBS
1949-B LPR6520
AL
1949-A LPR6520
AR
from/to uP Board
from / to Digital Board
from/to FV, MSP, VPS
1945-1
1945-2
1945-3
1945-4
1947
1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
2

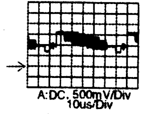
1940-1 A8
1940-2 A13
1940-3 A14
1942 E1
1943 C1
1945-1 I2
1947 I7
1948 F14
1949-A I14
1949-B H14
1949-C G14
2401 B4
2402 B1
2403 D3
2404 D3
2405 C8
2406 I4
2407 I2
2408 F3
2409 D8
2410 C4
2411 D6
2412 I2
2413 C6
2414 C7
2415 C10
2416 G11
2417 F4
2418 F9
2419 E6
2420 F13
2421 E1
2422 F13
2423 G8
2424 G13
2425 G12
2427 G9
2428 F2
2429 H13
2430 E12
2432 H13
2433 E8
2434 C8
2435 C7
2436 E10
2437 E9
2438 F9
2439 E8
2440 E8
2441 E10
2442 H13
2443 G13
2444 H13
2445 I11
2446 H6
2447 I14
2448 I13
2449 F1
2450 B2
2459 E2
2460 H11
2461 G11
2462 I11
2463 I13
2464 A3
3400 H3
3401 B11
3402 B11
3403 B12
3404 B4
3405 B2
3406 B2
3407 B2
3408 B1
3409 B5
3410 C6
3411 B10
3412 C5
3413 B6
3414 C5
3415 H4
3416 H4
3417 C11
3418 I3
3419 I4
3420 F11
3421 C14
3422 D13
3423 D14
3424 E14
3425 E12
3426 E13
3427 C10
3428 E13
3429 E1
3431 E12
3432 C3
3433 C3
3434 F13
3435 F13
3436 F13
3437 G1
3438 G1
3439 F5
3440 H3
3441 H13
3442 D13
3443 I11
3444 I13
3445 E5
3446 B3
3447 A3
3448 I11
3449 F12
3450 I13
3451 I4
3452 G9
3454 A3
3455 E4
3456 I14
3457 I11
3458 H2
3459 G4
3460 H3
3461 A14
3462 A13
3463 A13
3464 A12
3465 B7
3466 B7
3467 B8
3468 B8
3469 B13
3470 B12
3471 B7
3472 B8
3475 B9
3476 B9
3477 B14
3478 B14
3481 F2
3482 E4
3483 F3
3484 F3
3485 G11
3486 H11
3487 H13
3488 H13
3489 E1
3490 D4
3491 D11
3492 D11
3493 D12
3494 G8
3495 I11
3496 I14
3955 H6
4401 A8
4402 E1
5401 C4
5402 C9
5403 C6
5404 G12
5405 I12
5406 C8
5407 I14
6401 B4
6402 B6
6403 B6
6404 B6
6409 A4
6414 B5
6415 B11
6416 B11
6417 B12
6418 B12
6419 B10
6420 A5
6422 A11
6423 A8
6424 B10
6425 G13
6426 G13
6427 H13
6428 I13
6429 I14
7401 B2
7402 B3
7403 B1
7404 I4
7405 C14
7406 F12
7407 E14
7408 D8
7409 D14
7410 G11
7411 D3
7412 H5
7415 I12
7416 I14
7419 H2
7420 H3
7421 H4
F401 I2
F402 H2
F412 I5
F4203 F1
F4205 F2
F4207 F1
F4209 G1
F4210 E1
F4505 I2
F4707 I8
F4712 I9
F4714 I9
F4716 I10
F4718 I10
F4720 I10
F4721 I10
F4722 I10
F485 F14
F499 A3
F5101 B8
F5102 B7
F5103 B7
F5106 B6
F5108 A6
F5110 A5
F5113 A6
F5116 B5
F5119 B5
F5120 B4
F5201 A14
F5202 A13
F5206 A12
F5207 A12
F5208 C12
F5210 A11
F5211 A12
F5213 A12
F5215 A11
F5216 C11
F5219 A11
F5220 F11
F913 D10
I341 A13
I402 D14
I405 H7
I406 B2
I407 B2
I408 B3
I409 B3
I411 D2
I412 D4
I413 C3
I414 D6
I415 F3
I416 F3
I417 E4
I418 H1
I419 I1
I420 I6
I424 I5
I428 I4
I429 I2
I431 I11
I433 I13
I434 I13
I437 H13
I438 G13
I439 G13
I440 F13
I441 H13
I442 G12
I443 H12
I444 H12
I445 H12
I446 H11
I447 G11
I448 G12
I449 F13
I451 F13
I453 H4
I454 I4
I456 C7
I457 C7
I458 A6
I459 A6
I460 A5
I461 E6
I462 E6
I463 E6
I464 E6
I465 E6
I466 E6
I467 D14
I468 G6
I469 G6
I470 G6
I476 F8
I478 E8
I479 E8
I481 E8
I482 E8
I483 E8
I484 F12
I485 I11
I486 I14

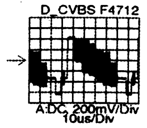
I465

A:DC, 500mV/Div 10us/Div

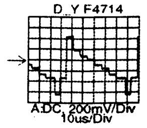
I461

A:DC, 500mV/Div 10us/Div

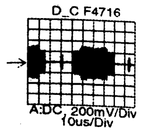
I462

A:DC, 500mV/Div 10us/Div

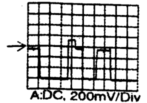
I463

A:DC, 500mV/Div 10us/Div

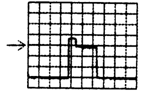
A_CVBS I405

A:DC, 500mV/Div 10us/Div

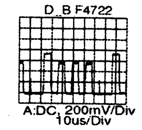
D_CVBS F4712

A:DC, 200mV/Div 10us/Div

D_Y F4714

A:DC, 200mV/Div 10us/Div

D_C F4716

A:DC, 200mV/Div 10us/Div

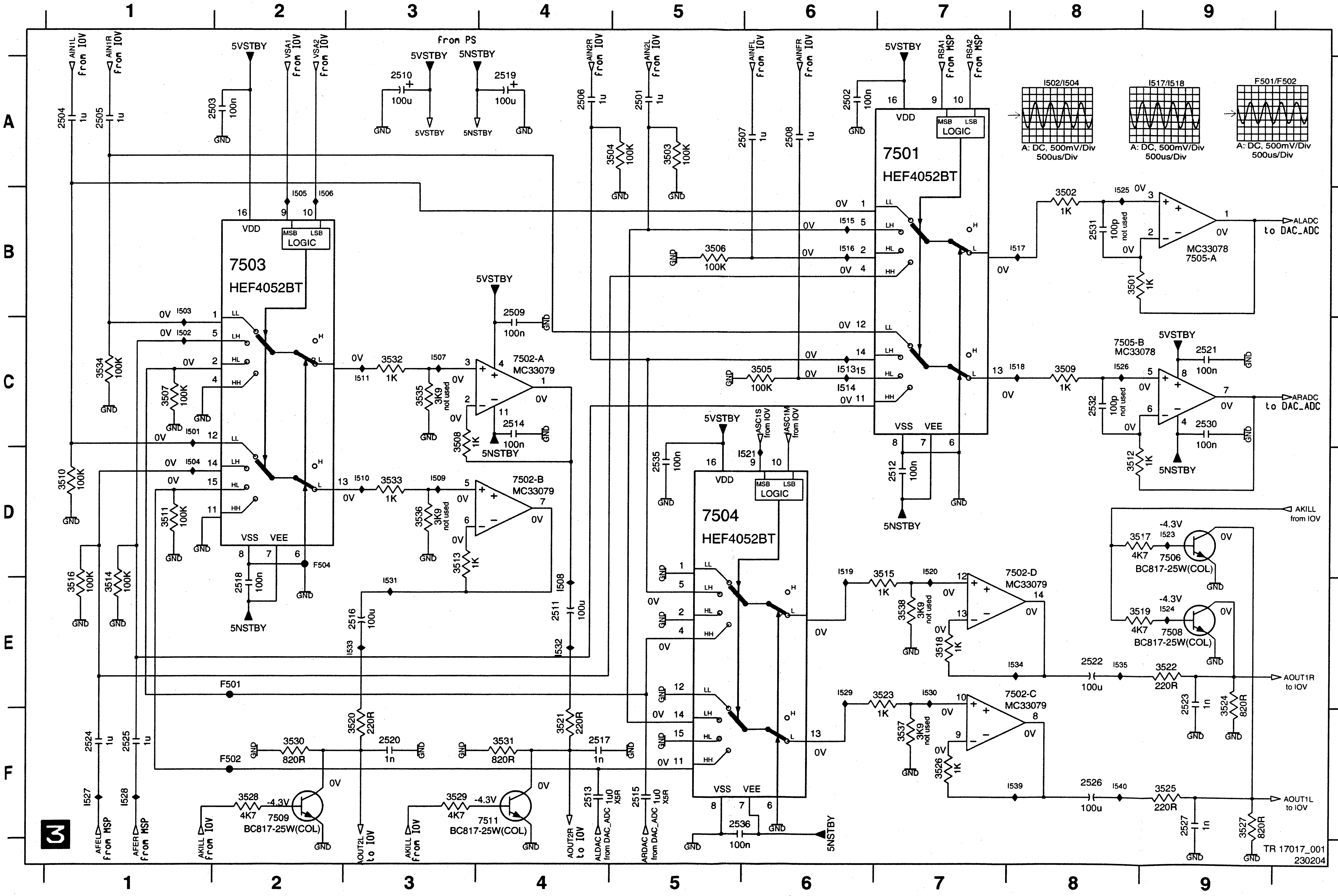
D_R F4718

A:DC, 200mV/Div 10us/Div

D_G F4720

A:DC, 200mV/Div 10us/Div

D_B F4722

A:DC, 200mV/Div 10us/Div

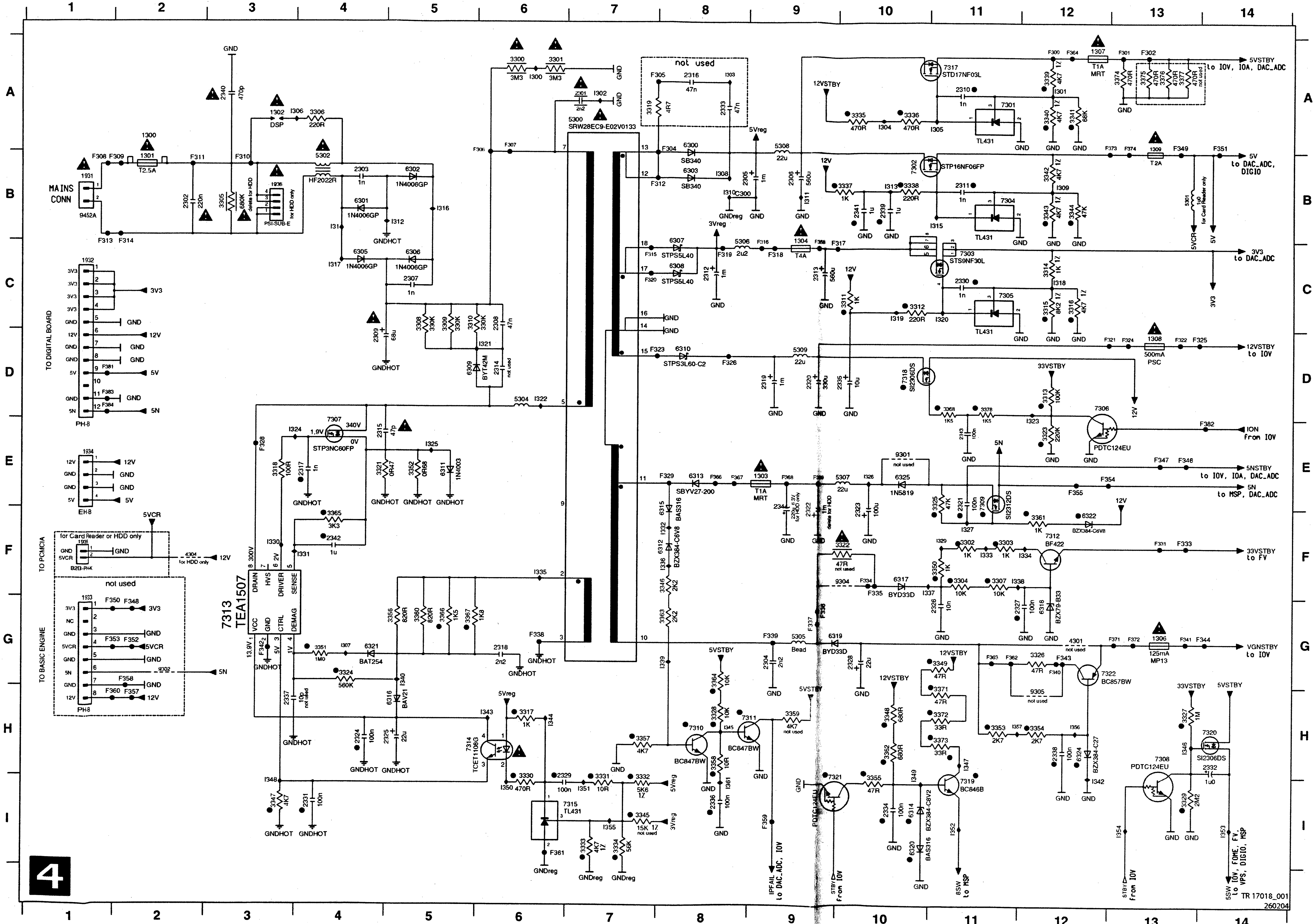
17016_001
190204

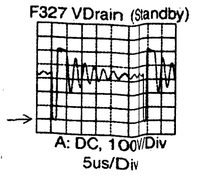
Analog Board: IN/Out Audio (IOA)


1 2 3 4 5 6 7 8 9
A B C D E F
AIN1L from IOV
AIN1R from IOV
5VSTBY
VSA1 from IOV
VSA2 from IOV
from PS
5VSTBY 5NSTBY
2510 100u
2519 100u
AIN2R from IOV
AIN2L from IOV
AINFL from IOV
AINFR from IOV
RSA1 from MSP
RSA2 from MSP
I502/I504
I517/I518
F501/F502
A: DC, 500mV/Div 500us/Div
7501 HEF4052BT
7503 HEF4052BT
7504 HEF4052BT
VDD MSB LSB LOGIC VSS VEE
LL LH HL HH
7502-A MC33079
7502-B MC33079
7502-C MC33079
7502-D MC33079
7505-A MC33078
7505-B MC33078
ALADC to DAC_ADC
ARADC to DAC_ADC
AKILL from IOV
-4.3V
7506 BC817-25W(COL)
7508 BC817-25W(COL)
7509 BC817-25W(COL)
7511 BC817-25W(COL)
AOUT1R to IOV
AOUT1L to IOV
ASC1S from IOV
ASC1M from IOV
AFEL from MSP
AFER from MSP
AKILL from IOV
AOUT2L to IOV
AOUT2R to IOV
ALDAC from DAC_ADC
ARDAC from DAC_ADC
5NSTBY
GND
0V
not used
F501 F502 F504
3
TR 17017_001 230204

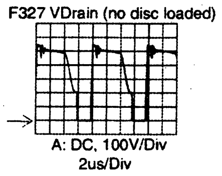
Component	Position
2501	A5
2502	A6
2503	A2
2504	A1
2505	A1
2506	A4
2507	A6
2508	A6
2509	B4
2510	A3
2511	E4
2512	D7
2513	F4
2514	C4
2515	F5
2516	E3
2517	F4
2518	E2
2519	A4
2520	F3
2521	C9
2522	E8
2523	E9
2524	F1
2525	F1
2526	F8
2527	F9
2530	C9
2531	B8
2532	C8
2535	D5
2536	F5
3501	B8
3502	B8
3503	A5
3504	A5
3505	C6
3506	B5
3507	C1
3508	C3
3509	C8
3510	D1
3511	D1
3512	D8
3513	D3
3514	E1
3515	D7
3516	E1
3517	D8
3518	E7
3519	E8
3520	F3
3521	F4
3522	E9
3523	E7
3524	E9
3525	F9
3526	F7
3527	F9
3528	F2
3529	F3
3530	F2
3531	F4
3532	C3
3533	D3
3534	C1
3535	C3
3536	D3
3537	F7
3538	E7
7501	A7
7502-A	C4
7502-B	D4
7502-C	E7
7502-D	D7
7503	B2
7504	D5
7505-A	B9
7505-B	C8
7506	D9
7508	E9
7509	F2
7511	F4
F501	E2
F502	F2
F504	D2
I501	C1
I502	C1
I503	B1
I504	D1
I505	B2
I506	B2
I507	C3
I508	E4
I509	D3
I510	D3
I511	C3
I513	C6
I514	C6
I515	B6
I516	B6
I517	B8
I518	C8
I519	D6
I520	D7
I521	D6
I523	D9
I524	E9
I525	B8
I526	C8
I527	F1
I528	F1
I529	E6
I530	E7
I531	E3
I532	E4
I533	E3
I534	E8
I535	E8
I539	F8
I540	F8

Analog Board: Power Supply (PS)

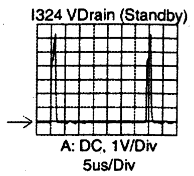

MAINS CONN
1931
9452A
1301 T2.5A
5302 HF2022R
1936 PSI-SUB-E
7313 TEA1507
DRAIN HVS DRIVER SENSE VCC GND CTRL DEMAG
7307 STP3NC60FP
7314 TCET1108G
7315 TL431
5300 SRW28EC9-E02V0133
not used
7317 STD17NF03L
7302 STP16NF06FP
7303 STS9NF30L
7301 TL431
7304 TL431
7305 TL431
7318 SI2306DS
7306 PDTC124EU
7309 SI2312DS
7312 BF422
7322 BC857BW
7310 BC847BW
7311 BC847BW
7321 PDTC124EU
7319 BC846B
7308 PDTC124EU
7320 SI2306DS
5VSTBY to IOV, IOA, DAC_ADC
5V to DAC_ADC, DIGIO
3V3 to DAC_ADC
12VSTBY to IOV
ION from IOV
5NSTBY to IOV, IOA, DAC_ADC
5N to MSP, DAC_ADC
33VSTBY to FV
VGNSTBY to IOV
IPFAIL to DAC_ADC, IOV
STBY from IOV
5SW to MSP
SSW to IOV, FOME, FV, VPS, DIGIO, MSP
TO DIGITAL BOARD
TO PCMCIA
TO BASIC ENGINE
for Card Reader or HDD only
PH-8
EH8
PH8
4
TR 17018_001
260204


F327 VDrain (Standby)

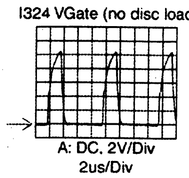
A: DC, 100V/Div
5us/Div


F327 VDrain (no disc loaded)

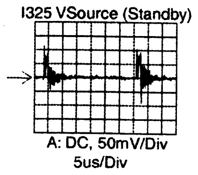
A: DC, 100V/Div
2us/Div


I324 VDrain (Standby)

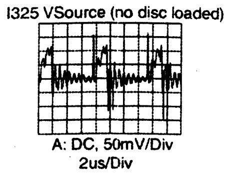
A: DC, 1V/Div
5us/Div


I324 VGate (no disc loaded)

A: DC, 2V/Div
2us/Div


I325 VSource (Standby)

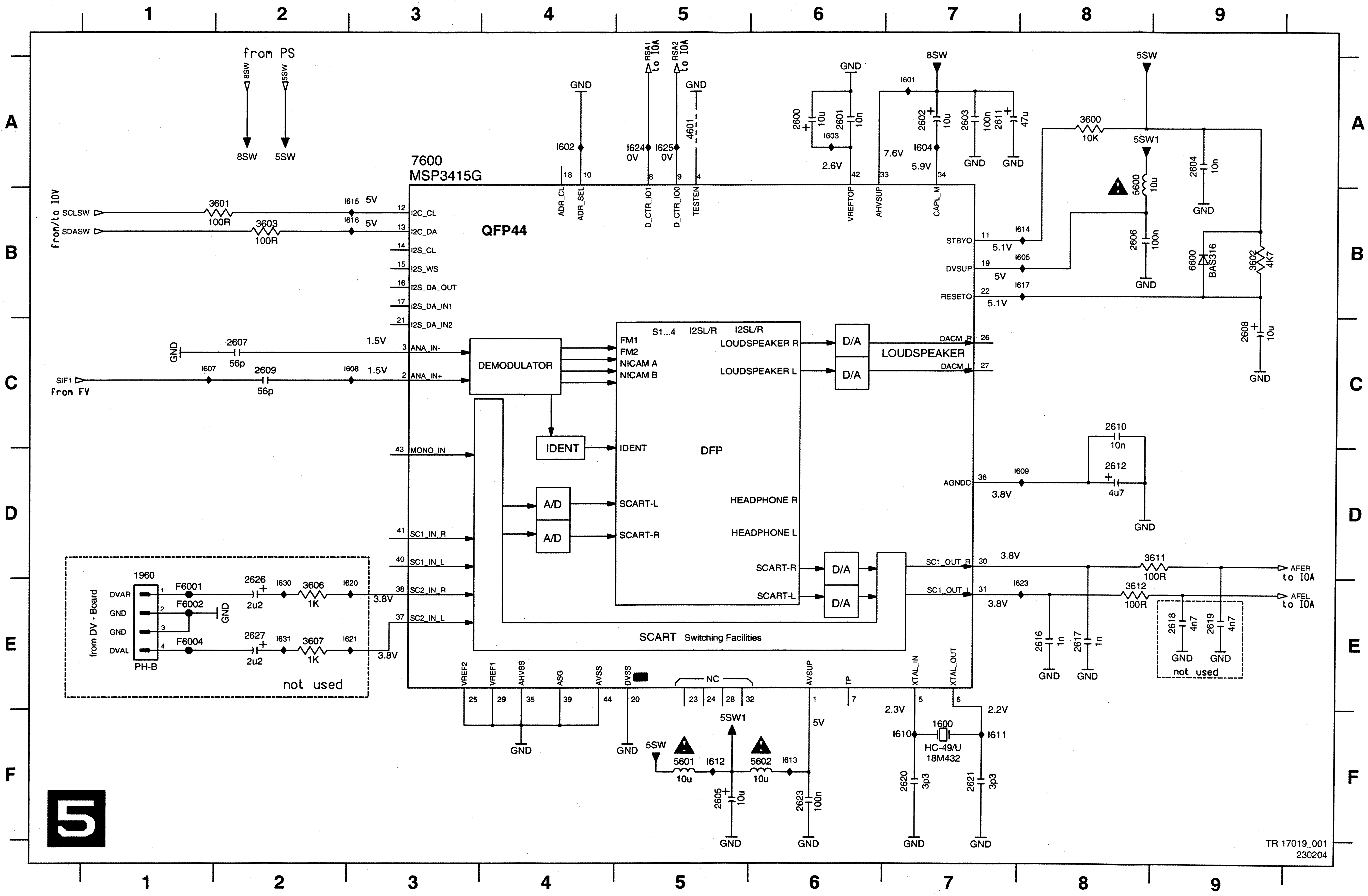
A: DC, 50mV/Div
5us/Div


I325 VSource (no disc loaded)

A: DC, 50mV/Div
2us/Div

1300	A2
1301	B2
1302	A3
1303	E9
1304	C9
1306	G13
1307	A12
1308	D13
1309	A13
1931	B1
1932	C1
1933	G1
1934	E1
1935	F1
1936	B3
2301	A7
2302	B2
2303	B4
2304	G9
2305	B8
2306	B9
2307	C5
2308	C6
2309	D4
2310	A11
2311	B11
2312	C8
2313	C9
2314	D6
2315	E4
2316	A8
2317	E4
2318	G6
2319	D9
2320	D9
2321	E11
2322	F9
2323	F10
2324	H4
2325	H5
2326	G11
2327	G12
2328	G10
2329	I6
2330	C11
2331	I4
2332	H14
2333	A8
2334	I10
2335	D10
2336	I8
2337	H3
2338	H12
2339	B10
2340	A3
2341	B10
2342	F4
2343	E11
2344	F9
3300	A6
3301	A6
3302	F11
3303	F11
3304	F11
3305	B3
3306	A4
3307	F11
3308	C5
3309	C5
3310	C5
3311	C10
3312	C10
3313	D12
3314	C12
3315	C12
3316	C12
3317	H6
3318	E3
3319	A7
3321	E4
3322	F10
3323	E12
3324	G4
3325	E11
3326	G12
3327	H13
3328	H8
3329	I13
3330	I6
3331	I7
3332	I7
3333	I7
3334	I7
3335	A10
3336	A10
3337	B10
3338	B10
3339	A12
3340	A12
3341	A12
3342	B12
3343	B12
3344	B12
3345	I7
3346	F8
3347	I3
3348	H10
3349	G11
3350	F11
3351	G4
3352	E5
3353	H11
3354	H12
3355	I10
3356	G5
3357	H7
3358	H8
3359	H9
3360	G5
3361	F12
3362	H10
3363	G8
3364	G8
3365	F4
3366	G5
3367	G5
3368	D11
3371	H11
3372	H11
3373	H11
3374	A13
3375	A13
3376	A13
3377	A13
3378	D11
4301	G12
4304	F2
5300	A6
5301	B13
5302	B4
5304	D6
5305	G9
5306	C8
5307	E10
5308	A9
5309	D9
6300	A8
6301	B4
6302	B5
6303	B8
6305	C4
6306	C5
6307	C8
6308	C8
6309	D5
6310	D8
6311	E5
6312	F8
6313	E8
6314	I10
6315	F8
6316	H5
6317	F10
6318	G12
6319	G9
6320	I10
6321	G4
6322	F12
6324	H12
6325	E10
7301	A11
7302	B10
7303	C11
7304	B11
7305	C11
7306	D12
7307	E4
7308	H13
7309	E11
7310	H8
7311	H8
7312	F12
7313	G3
7314	H5
7315	I6
7317	A11
7318	D10
7319	I11
7320	H14
7321	I10
7322	G12
9301	E10
9302	G2
9304	F10
9305	H12
C300	B8
F300	A12
F301	A13
F302	A13
F304	A8
F305	A7
F306	B6
F307	A6
F308	B1
F309	B2
F310	B3
F311	B2
F312	B7
F313	C1
F314	C2
F315	C7
F316	C9
F317	C9
F318	C9
F319	C8
F320	C7
F321	D12
F322	D13
F323	D7
F324	D13
F325	D13
F326	D8
F328	E3
F329	E8
F331	F13
F333	F13
F334	F10
F335	F10
F336	G9
F337	G9
F338	G6
F339	G9
F340	G12
F341	G13
F342	G3
F343	G12
F344	G14
F346	E13
F347	E13
F348	G2
F349	A13
F350	G1
F351	A14
F352	G2
F353	G1
F354	E12
F355	E12
F356	C9
F357	H2
F358	G2
F359	I9
F360	H1
F361	I6
F362	G11
F363	G11
F364	A12
F366	E8
F367	E8
F368	E9
F369	E9
F371	G13
F372	G13
F373	A12
F374	A13
F381	D1
F382	E14
F383	D1
F384	D1
I300	A6
I301	A12
I302	A7
I303	A8
I304	A10
I305	A11
I306	A3
I307	G4
I308	B8
I309	B12
I310	B8
I311	B9
I312	B5
I313	B10
I314	B4
I315	B11
I316	B5
I317	C4
I318	C12
I319	C10
I320	C11
I321	D6
I322	D6
I323	D12
I324	E3
I325	E5
I326	E10
I327	F11
I329	F11
I330	F3
I331	F4
I332	F8
I333	F11
I334	F12
I335	F6
I336	F8
I337	F10
I338	F11
I339	G8
I340	G5
I342	I12
I343	H6
I344	H6
I345	H8
I346	H13
I347	H11
I348	I3
I349	H10
I350	I6
I351	I7
I352	I11
I353	I14
I354	I13
I355	I7
I356	H12
I357	H11
I361	I8

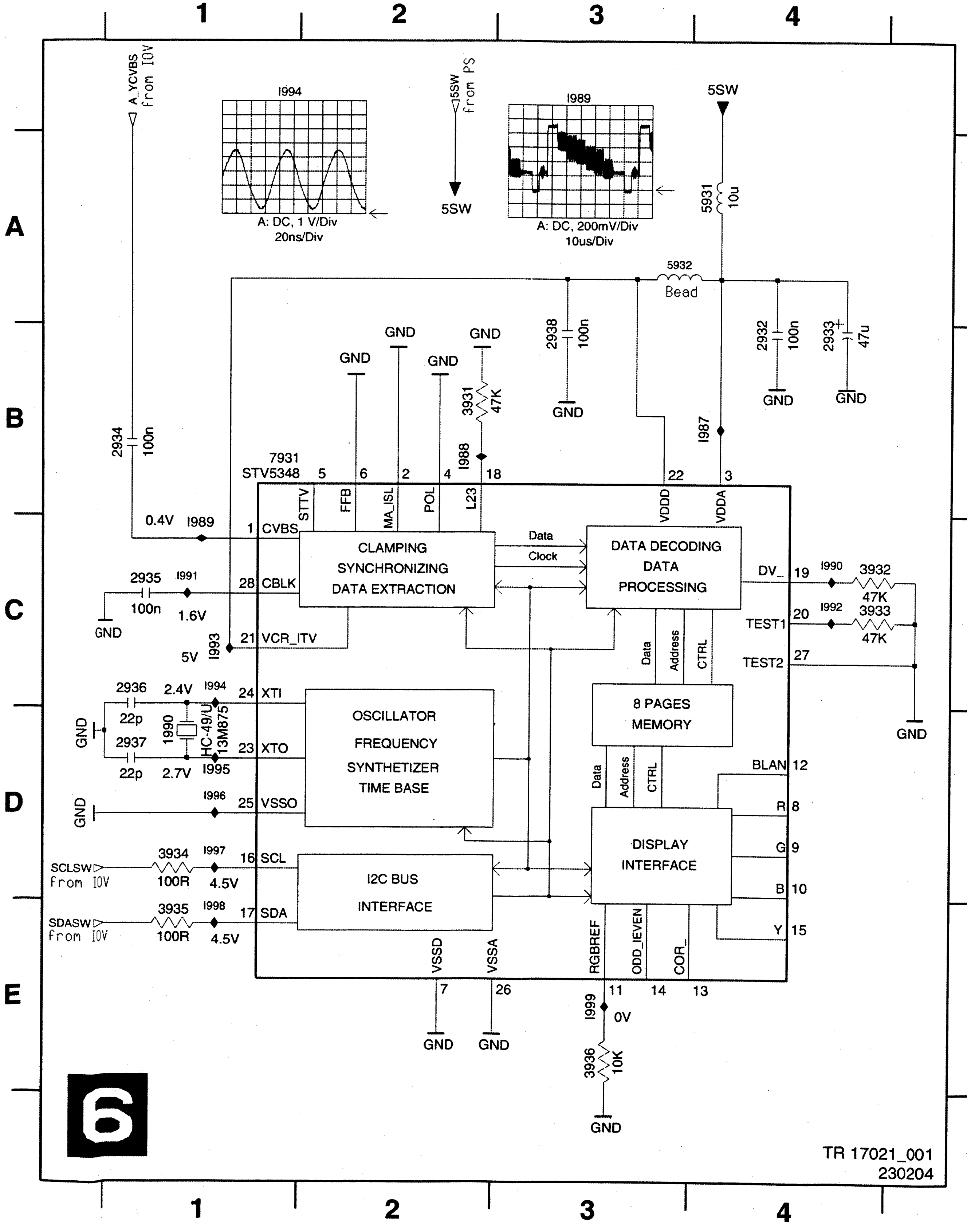
Analog Board: Multi Sound Processing (MSP)


from PS
8SW
5SW
GND
RSA1 to 10A
RSA2 to 10A
4601
I602
I624 0V
I625 0V
7600
MSP3415G
QFP44
ADR_CL
ADR_SEL
D_CTR_I01
D_CTR_I00
TESTEN
VREFTOP
AHVSUP
CAPL_M
2600 10u
2601 10n
I603
2.6V
I601
2602 10u
2603 100n
2611 47u
I604
7.6V
5.9V
3600 10K
5SW1
5600 10u
2604 10n
2606 100n
6600 BAS316
3602 4K7
2608 10u
STBYQ
DVSUP
RESETQ
I614 5.1V
I605 5V
I617 5.1V
from/to 10V
SCLSW
SDASW
3601 100R
3603 100R
I615 5V
I616 5V
I2C_CL
I2C_DA
I2S_CL
I2S_WS
I2S_DA_OUT
I2S_DA_IN1
I2S_DA_IN2
2607 56p
2609 56p
I607
I608
SIF1
from FV
1.5V
ANA_IN-
ANA_IN+
DEMODULATOR
IDENT
FM1
FM2
NICAM A
NICAM B
S1...4
I2SL/R
LOUDSPEAKER R
LOUDSPEAKER L
D/A
DACM_R
DACM_L
LOUDSPEAKER
DFP
MONO_IN
A/D
SCART-L
SCART-R
HEADPHONE R
HEADPHONE L
SC1_IN_R
SC1_IN_L
SC2_IN_R
SC2_IN_L
SC1_OUT_R
SC1_OUT_L
SCART Switching Facilities
2610 10n
2612 4u7
AGNDC
I609
3.8V
3611 100R
3612 100R
I623
AFER to 10A
AFEL to 10A
2616 1n
2617 1n
2618 4n7
2619 4n7
not used
1960
from DV - Board
DVAR
GND
DVAL
PH-B
F6001
F6002
F6004
2626 2u2
2627 2u2
I630
I631
3606 1K
3607 1K
I620
I621
VREF2
VREF1
AHVSS
ASG
AVSS
DVSS
NC
AVSUP
TP
XTAL_IN
XTAL_OUT
2.3V
2.2V
I610
I611
1600
HC-49/U
18M432
2620 3p3
2621 3p3
5SW
5601 10u
I612
5602 10u
I613
2605 10u
2623 100n
5V
5
TR 17019_001
230204

1600	F7
1960	E1
2600	A6
2601	A6
2602	A7
2603	A7
2604	A9
2605	F5
2606	B8
2607	C2
2608	C9
2609	C2
2610	C8
2611	A7
2612	D8
2616	E8
2617	E8
2618	E9
2619	E9
2620	F7
2621	F7
2623	F6
2626	E2
2627	E2
3600	A8
3601	B2
3602	B9
3603	B2
3606	E2
3607	E2
3611	D9
3612	E8
4601	A5
5600	A8
5601	F5
5602	F6
6600	B9
7600	A3
F6001	E1
F6002	E1
F6004	E1
I601	A7
I602	A4
I603	A6
I604	A7
I605	B8
I607	C1
I608	C3
I609	D8
I610	F7
I611	F7
I612	F5
I613	F6
I614	B8
I615	B3
I616	B3
I617	B8
I620	E3
I621	E3
I623	E8
I624	A5
I625	A5
I630	E2
I631	E2

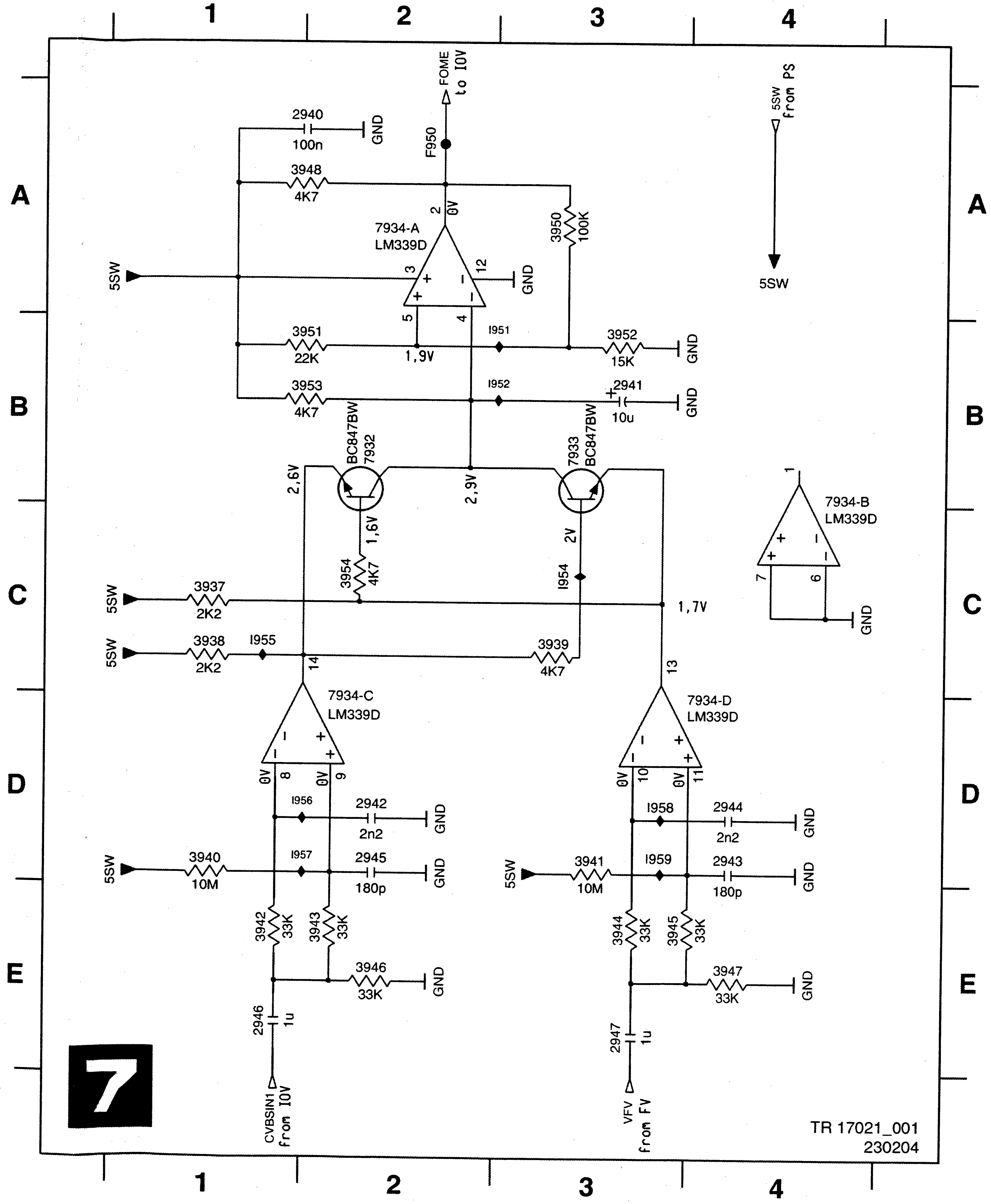
Analog Board: VPS

1990 D1	2934 B1	2937 D1	3932 C4	3935 E1	5932 A3	I988 B2	I991 C1	I994 C1	I997 D1
2932 B4	2935 C1	2938 B3	3933 C4	3936 E3	7931 B2	I989 C1	I992 C4	I995 D1	I998 E1
2933 B4	2936 C1	3931 B2	3934 D1	5931 A4	I987 B4	I990 C4	I993 C1	I996 D1	I999 E3


1
2
3
4
A
B
C
D
E
A_YCVBS from IOV
I994
A: DC, 1 V/Div
20ns/Div
5SW from PS
5SW
I989
A: DC, 200mV/Div
10us/Div
5SW
5931
10u
5932
Bead
2938
100n
2932
100n
2933
47u
GND
3931
47K
I988
I987
2934
100n
7931
STV5348
5
6
2
4
18
22
3
STTV
FFB
MA_ISL
POL
L23
VDDD
VDDA
0.4V
I989
1 CVBS
CLAMPING
SYNCHRONIZING
DATA EXTRACTION
Data
Clock
DATA DECODING
DATA
PROCESSING
DV_
19
I990
3932
47K
2935
I991
100n
1.6V
28 CBLK
TEST1
20
I992
3933
47K
TEST2
27
5V
I993
21 VCR_ITV
Data
Address
CTRL
2936
2.4V
I994
24 XTI
22p
1990
HC-49/U
13M875
2937
22p
2.7V
I995
23 XTO
OSCILLATOR
FREQUENCY
SYNTHETIZER
TIME BASE
8 PAGES
MEMORY
BLAN
12
I996
25 VSSO
R
8
DISPLAY
INTERFACE
G
9
SCLSW from IOV
3934
100R
I997
4.5V
16 SCL
I2C BUS
INTERFACE
B
10
SDASW from IOV
3935
100R
I998
4.5V
17 SDA
Y
15
VSSD
VSSA
RGBREF
ODD_/EVEN
COR_
7
26
11
14
13
I999
0V
3936
10K
GND
6
TR 17021_001
230204

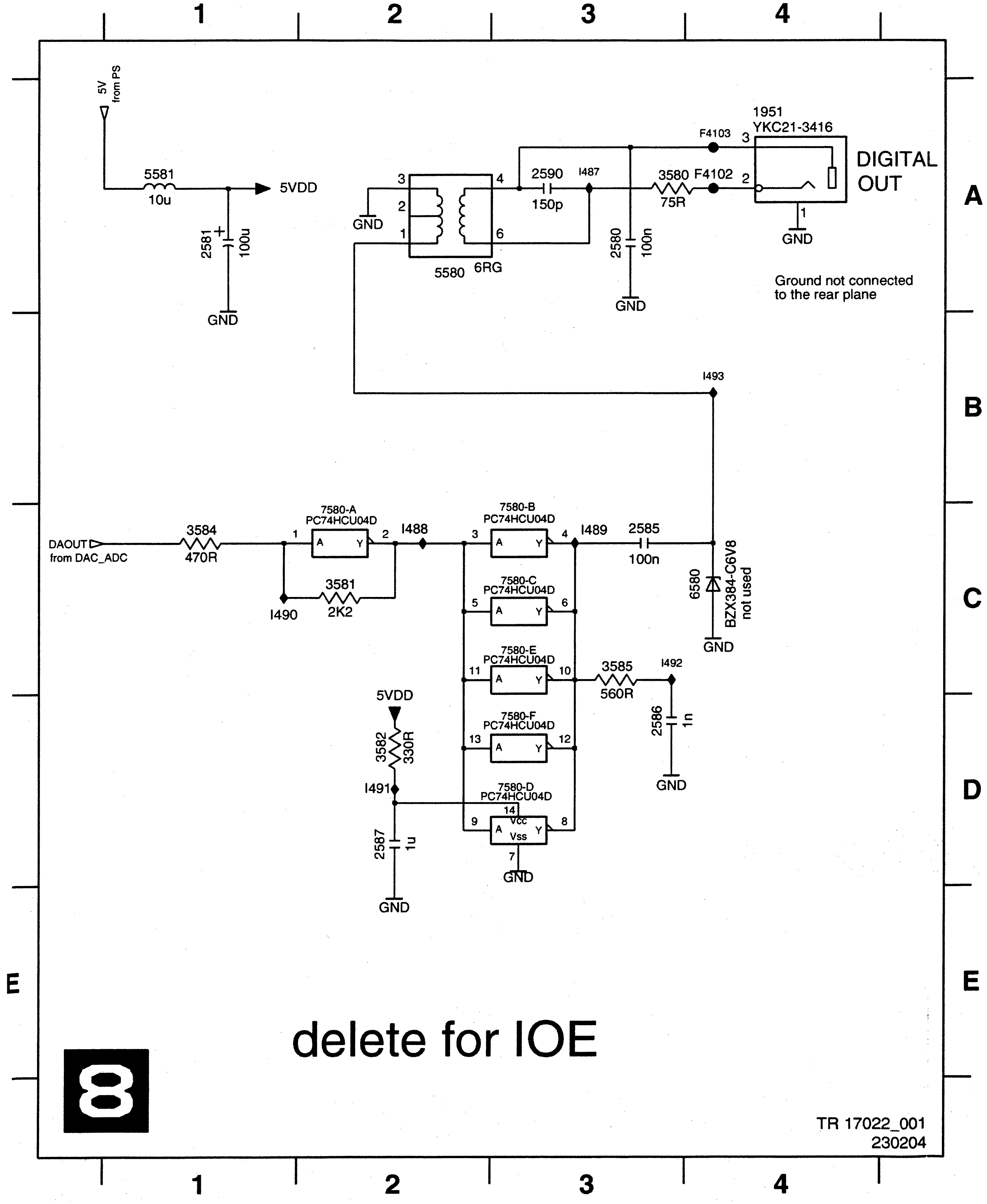
Analog Board: Follow Me (FOME)

2940 A2	2944 D4	3937 C1	3941 D3	3945 E3	3950 A3	3954 C2	7934-B B4	I951 B3	I956 D2
2941 B3	2945 D2	3938 C1	3942 E1	3946 E2	3951 B2	7932 B2	7934-C C2	I952 B3	I957 D2
2942 D2	2946 E1	3939 C3	3943 E2	3947 E4	3952 B3	7933 B3	7934-D C3	I954 C3	I958 D3
2943 D4	2947 E3	3940 D1	3944 E3	3948 A2	3953 B2	7934-A A2	F950 A2	I955 C1	I959 D3


1
2
3
4
A
B
C
D
E
FOME to IOV
F950
2940
100n
GND
3948
4K7
2
0V
7934-A
LM339D
3950
100K
5SW
3
5
4
12
5SW from PS
5SW
3951
22K
1,9V
I951
3952
15K
3953
4K7
I952
2941
10u
BC847BW
7932
2,6V
2,9V
7933
BC847BW
1,6V
3954
4K7
2V
I954
7934-B
LM339D
1
7
6
3937
2K2
1,7V
3938
2K2
I955
3939
4K7
14
13
7934-C
LM339D
7934-D
LM339D
0V
8
9
10
11
I956
2942
2n2
I958
2944
2n2
3940
10M
I957
2945
180p
3941
10M
I959
2943
180p
3942
33K
3943
33K
3944
33K
3945
33K
3946
33K
3947
33K
2946
1u
2947
1u
CVBSIN1 from IOV
VFV from FV
7
TR 17021_001
230204

Analog Board: Digital In / Out (DIGIO)

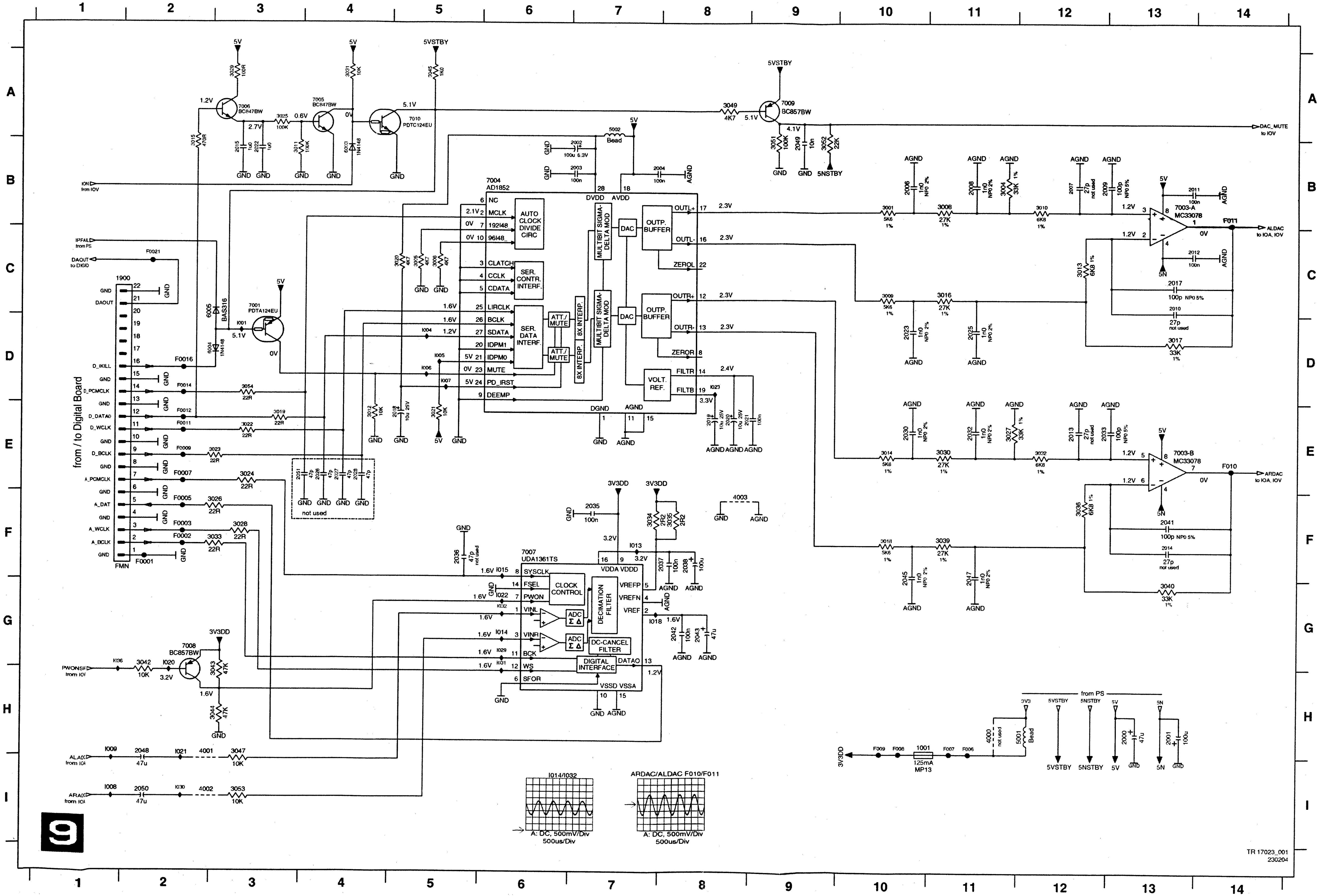
1951 A4	2585 C3	2590 A3	3582 D2	5580 A2	7580-A C2	7580-D D3	F4102 A4	I488 C2	I491 D2
2580 A3	2586 D3	3580 A3	3584 C1	5581 A1	7580-B C3	7580-E C3	F4103 A4	I489 C3	I492 C3
2581 A1	2587 D2	3581 C2	3585 C3	6580 C4	7580-C C3	7580-F D3	I487 A3	I490 C1	I493 B4


1
2
3
4
A
B
C
D
E
5V from PS
5581
10u
5VDD
2581
100u
GND
3
2
1
4
6
5580
6RG
2590
150p
I487
3580
75R
F4102
F4103
1951
YKC21-3416
DIGITAL OUT
2580
100n
Ground not connected to the rear plane
I493
DAOUT from DAC_ADC
3584
470R
7580-A PC74HCU04D
I488
7580-B PC74HCU04D
I489
2585
100n
3581
2K2
I490
7580-C PC74HCU04D
6580
BZX384-C6V8 not used
7580-E PC74HCU04D
3585
560R
I492
2586
1n
5VDD
3582
330R
7580-F PC74HCU04D
I491
7580-D PC74HCU04D
Vcc
Vss
2587
1u
8

delete for IOE

TR 17022_001
230204

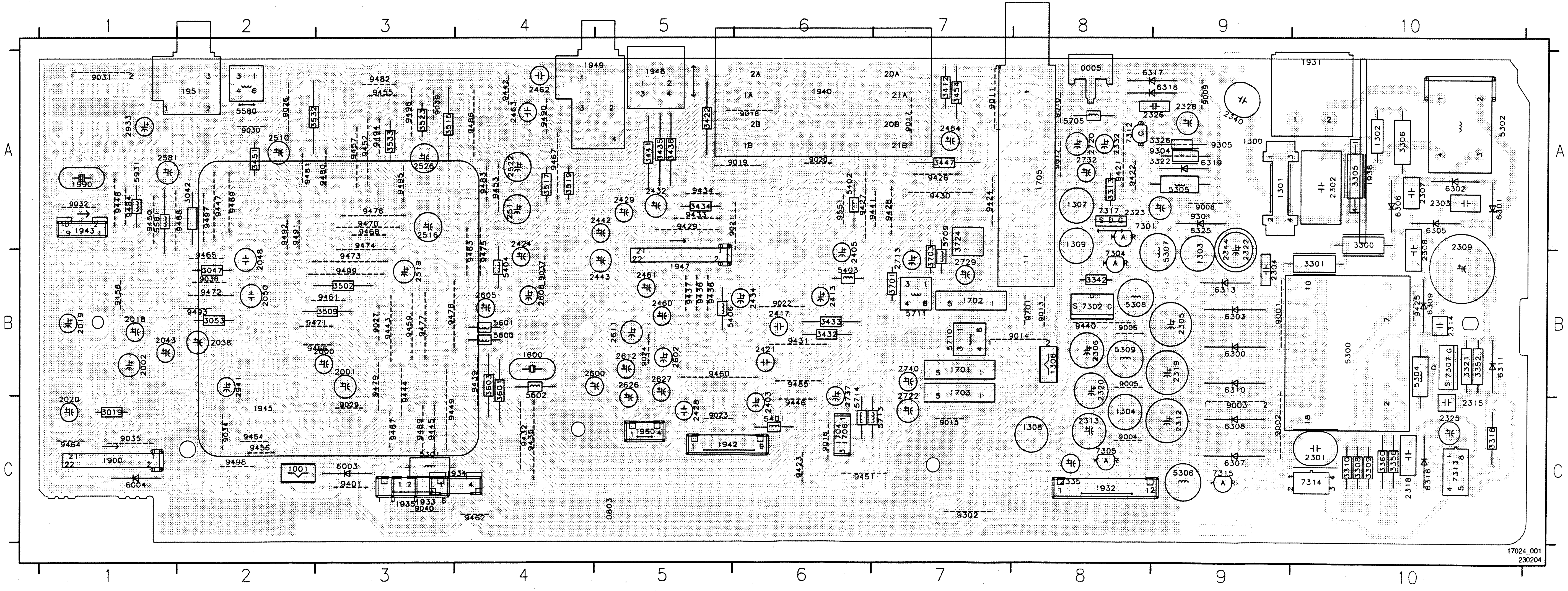
Analog Board: Audio Converter (DAC_ADC)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
5V
5VSTBY
7006 BC847BW
7005 BC847BW
7010 PDTC124EU
7009 BC857BW
DAC_MUTE to IOV
ION from IOV
IPFAIL from PS
DAOUT to DIGIO
1900
FMN
from / to Digital Board
D_IKILL
D_PCMCLK
D_DATAO
D_WCLK
D_BCLK
A_PCMCLK
A_DAT
A_WCLK
A_BCLK
DAOUT
GND
7001 PDTA124EU
BAS316
1N4148
7004 AD1852
NC
MCLK
192I48
96I48_
CLATCH
CCLK
CDATA
LIRCLK
BCLK
SDATA
IDPM1
IDPM0
MUTE
PD_IRST
DEEMP
AUTO CLOCK DIVIDE CIRC
SER. CONTR. INTERF.
SER. DATA INTERF.
ATT./ MUTE
8X INTERP.
MULTIBIT SIGMA-DELTA MOD
DAC
OUTP. BUFFER
VOLT. REF.
OUTL+
OUTL-
ZEROL
OUTR+
OUTR-
ZEROR
FILTR
FILTB
DVDD
AVDD
DGND
AGND
5002 Bead
7003-A MC33078
7003-B MC33078
ALDAC to IOA, IOV
ARDAC to IOA, IOV
F011
F010
not used
3V3DD
7007 UDA1361TS
SYSCLK
FSEL
PWON
VINL
VINR
BCK
WS
SFOR
CLOCK CONTROL
DECIMATION FILTER
ADC Σ Δ
DC-CANCEL FILTER
DIGITAL INTERFACE
DATAO
VDDA VDDD
VREFP
VREFN
VREF
VSSD VSSA
7008 BC857BW
PWONSF from IOV
ALADC from IOA
ARADC from IOA
from PS
3V3
5NSTBY
5N
1001 125mA MP13
5001 Bead
I014/I032
A: DC, 500mV/Div 500us/Div
ARDAC/ALDAC F010/F011
A: DC, 500mV/Div 500us/Div
9
TR 17023_001 230204

1001	H10
1900	C2
2000	H13
2001	H13
2002	B7
2003	B7
2004	B7
2006	B10
2007	B12
2008	B11
2009	B12
2010	C13
2011	B13
2012	C13
2013	E12
2014	F13
2015	B3
2017	C13
2018	E5
2019	E8
2020	E8
2021	E8
2022	B3
2023	D10
2025	D11
2026	E4
2027	E4
2028	E4
2030	E10
2032	E11
2033	E12
2035	F7
2036	F5
2037	F7
2038	F8
2041	F13
2042	G8
2043	G8
2045	F10
2047	F11
2048	H2
2049	B9
2050	I2
2051	E3
3001	B10
3004	B11
3005	C5
3006	C5
3008	B11
3009	C10
3010	B12
3011	B3
3012	E4
3013	C12
3014	E10
3015	B2
3016	C11
3017	D13
3018	F10
3019	E3
3020	C5
3021	E5
3022	E3
3023	E3
3024	E3
3025	A3
3026	F3
3027	E11
3028	F3
3029	A3
3030	E11
3031	A4
3032	E12
3033	F3
3034	F7
3035	F8
3036	F12
3039	F11
3040	G13
3042	G2
3043	H3
3044	H3
3045	A5
3047	H3
3049	A8
3051	B9
3052	B9
3053	I3
3054	D3
4000	H11
4001	H2
4002	I2
4003	F8
5001	H12
5002	A7
6003	B4
6004	D2
6005	C2
7001	C3
7003-A	B13
7003-B	E13
7004	B6
7005	A4
7006	A3
7007	F6
7008	G2
7009	A9
7010	A5
F0001	F2
F0002	F2
F0003	F2
F0005	F2
F0007	E2
F0009	E2
F0011	E2
F0012	E2
F0014	D2
F0016	D2
F0021	C2
F006	H11
F007	H11
F008	H10
F009	H10
F010	E14
F011	B14
I001	D3
I004	D5
I005	D5
I006	D5
I007	D5
I008	I1
I009	H1
I013	F7
I014	G6
I015	F6
I018	G7
I020	G2
I021	H2
I022	G6
I023	D8
I029	G6
I030	I2
I031	G6
I032	G6
I036	G1

Layout Analog Board (Top View)

0005 A8	1702 B7	1943 A1	2038 B2	2313 C8	2344 B9	2461 B5	2608 B4	3019 C1	3322 A9	3447 A7	3703 B7	5404 B4	6003 C3	6316 C10	7317 A8	9015 C7	9031 A1	9422 A8	9436 B5	9450 A1	9464 C1	9478 B3	9492 A2
0803 C5	1703 B7	1945 C2	2043 B1	2314 B10	2403 C6	2462 A4	2611 B5	3042 A2	3326 A9	3451 A2	3724 A7	5406 B5	6004 C1	6317 A8	9001 B9	9016 C6	9032 A1	9423 C6	9437 B5	9451 C6	9465 B2	9479 B3	9493 B2
1001 C2	1704 C6	1947 B5	2048 B2	2315 C10	2405 B6	2463 A4	2612 B5	3047 B2	3342 B8	3454 A7	5300 B10	5580 A2	6300 B9	6318 A9	9002 C9	9017 A7	9034 C2	9424 A7	9438 B5	9452 A3	9466 B3	9480 A3	9494 A3
1300 A9	1705 A8	1948 A5	2050 B2	2318 C10	2413 B6	2464 A7	2626 B5	3053 B2	3352 B10	3502 B3	5301 C3	5581 A1	6301 A10	6319 A9	9003 C9	9018 A6	9035 C1	9425 B10	9439 B4	9453 A4	9467 A4	9481 A2	9495 A3
1301 A9	1706 C6	1949 A4	2301 C10	2319 B9	2417 B6	2510 A2	2627 B5	3300 A10	3356 C10	3509 B3	5302 A10	5600 B4	6302 A10	6325 A9	9004 C8	9019 A6	9037 B4	9426 A7	9440 B8	9454 C2	9468 A3	9482 A3	9496 A3
1302 A10	1900 C1	1951 A2	2302 A10	2320 B8	2421 B6	2511 A4	2713 B7	3301 B10	3360 C10	3515 A3	5304 B10	5601 B4	6303 B9	7301 A8	9005 B8	9020 A6	9038 B2	9427 A6	9441 A6	9455 A3	9469 A2	9483 A4	9497 A2
1303 B9	1931 A10	1960 C5	2303 A10	2322 B9	2424 A4	2516 A3	2720 A8	3305 A10	3412 A7	3517 A4	5305 A9	5602 C4	6305 A10	7302 B8	9006 B8	9021 A5	9039 A3	9428 A7	9442 A4	9456 C2	9470 A3	9484 A1	9498 C2
1304 C8	1932 C8	1990 A1	2304 B9	2323 A8	2428 C5	2519 B3	2722 C7	3306 A10	3422 A5	3519 A4	5306 C9	5705 A8	6306 A10	7304 B8	9008 A9	9022 B6	9040 C3	9429 A5	9443 B3	9457 A3	9471 B3	9485 B6	9499 B3
1306B8	1933 C3	2000 B3	2305 B9	2325 C10	2429 A5	2522 A4	2729 B7	3308 C10	3432 B6	3523 A3	5307 B9	5709 A7	6307 C9	7305 C8	9009 A9	9023 C5	9301 A9	9430 A7	9444 B3	9458 B1	9472 B2	9486 A4	9551 A6
1307 A8	1934 C4	2001 B3	2306 B8	2326 A9	2432 A5	2526 A3	2732 A8	3309 C10	3433 B6	3532 A2	5308 B8	5710 B7	6308 C9	7307 B10	9010 A8	9024 B5	9302 C7	9431 B6	9445 C3	9459 B3	9473 B3	9487 C3	9701 B8
1308 C8	1935 C3	2002 B1	2307 A10	2328 A9	2434 B6	2581 A1	2737 C6	3310 C10	3434 A5	3533 A3	5309 B8	5711 B7	6309 B10	7312 A8	9011 A7	9026 A2	9304 A9	9432 C4	9446 C6	9460 B5	9474 A3	9488 A2	
1309 A8	1936 A10	2018 B1	2308 B10	2332 A8	2442 A5	2600 B5	2740 B7	3313 A8	3435 A5	3601 B4	5401 C6	5713 C7	6310 B9	7313 C10	9012 A8	9027 B3	9305 A9	9433 A5	9447 A2	9461 B3	9475 B4	9489 C3	
1600 B4	1940 A6	2019B1	2309 A10	2335 C8	2443 B5	2602 B5	2933 A1	3318 C10	3436 A5	3603 B4	5402 A6	5714 C6	6311 B10	7314 C10	9013 B8	9029 C3	9401 C3	9434 A5	9448 A1	9462 C4	9476 A3	9490 A4	
1701 B7	1942 C5	2020 C1	2312 C9	2340 A9	2460 B5	2605 B4	2941 B2	3321 B10	3441 A5	3701 B7	5403 B6	5931 A1	6313 B9	7315 C9	9014 B8	9030 A2	9421 A5	9435 C4	9449 C3	9463 B4	9477 B3	9491 A2	



Layout Analog Board (Overview Bottom View)

2003	B10
2004	B10
2006	B10
2007	B10
2008	B10
2009	B10
2010	B10
2011	B10
2012	B10
2013	B10
2014	B10
2015	C9
2017	B10
2021	C10
2022	C9
2023	B10
2025	B10
2026	C10
2027	C10
2028	C10
2030	B10
2032	B10
2033	B10
2035	C9
2036	B9
2037	B9
2041	B10
2042	B10
2045	B10
2047	B10
2049	A9
2051	C10
2310	B3
2311	B3
2316	B2
2317	B1
2321	B2
2324	C1
2327	A3
2329	C2
2330	C3
2331	C1
2333	B2
2334	B8
2336	A2
2337	C1
2338	A2
2339	B3
2341	B3
2342	C1
2343	B3
2401	A4
2402	A4
2404	C6
2406	A9
2407	A9
2408	B5
2409	A5
2410	A6
2411	B5
2412	A9
2414	B5
2415	A4
2416	A5
2418	A5
2419	B5
2420	A6
2422	A5
2423	A6
2425	A7
2427	A6
2430	A5
2433	B5
2435	B6
2436	B6
2437	B6
2438	B6
2439	B6
2440	B6
2441	B6
2444	A6
2445	A7
2446	C5
2447	A7
2448	A7
2449	C6
2450	A4
2459	B6
2501	A5
2502	B8
2503	A9
2504	A6
2505	A6
2506	A6
2507	C6
2508	C6
2509	A8
2512	B8
2513	A7
2514	A8
2515	A8
2517	A6
2518	A8
2520	A6
2521	B9
2523	A6
2524	B8
2525	B7
2527	A6
2530	B9
2531	B9
2532	B9
2535	A8
2536	A7
2580	A9
2585	A9
2586	A9
2587	A10
2590	A9
2601	B6
2603	B6
2604	B7
2606	B7
2607	B7
2609	C7
2610	B6
2616	B6
2617	B6
2618	B6
2619	B7
2620	B7
2621	B7
2623	B7
2719	B4
2721	B4
2723	B4
2724	B5
2725	B3
2727	B4
2728	B4
2730	B4
2731	B4
2733	A3
2734	B3
2735	A3
2736	A3
2741	B4
2742	B4
2932	A1
2934	A1
2935	A10
2936	A10
2937	A10
2938	A10
2940	B9
2942	B9
2943	B9
2944	B9
2945	B9
2946	B9
2947	C8
3001	B10
3004	B10
3005	C10
3006	C10
3008	B10
3009	B10
3010	B10
3011	C9
3012	C9
3013	B10
3014	B10
3015	C10
3016	B10
3017	B10
3018	B10
3020	B10
3021	B10
3022	C10
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3025	C9
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3029	C9
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3031	C8
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3033	C10
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3039	B10
3040	B10
3043	C9
3044	B9
3045	A9
3049	A9
3051	A9
3052	A8
3054	C10
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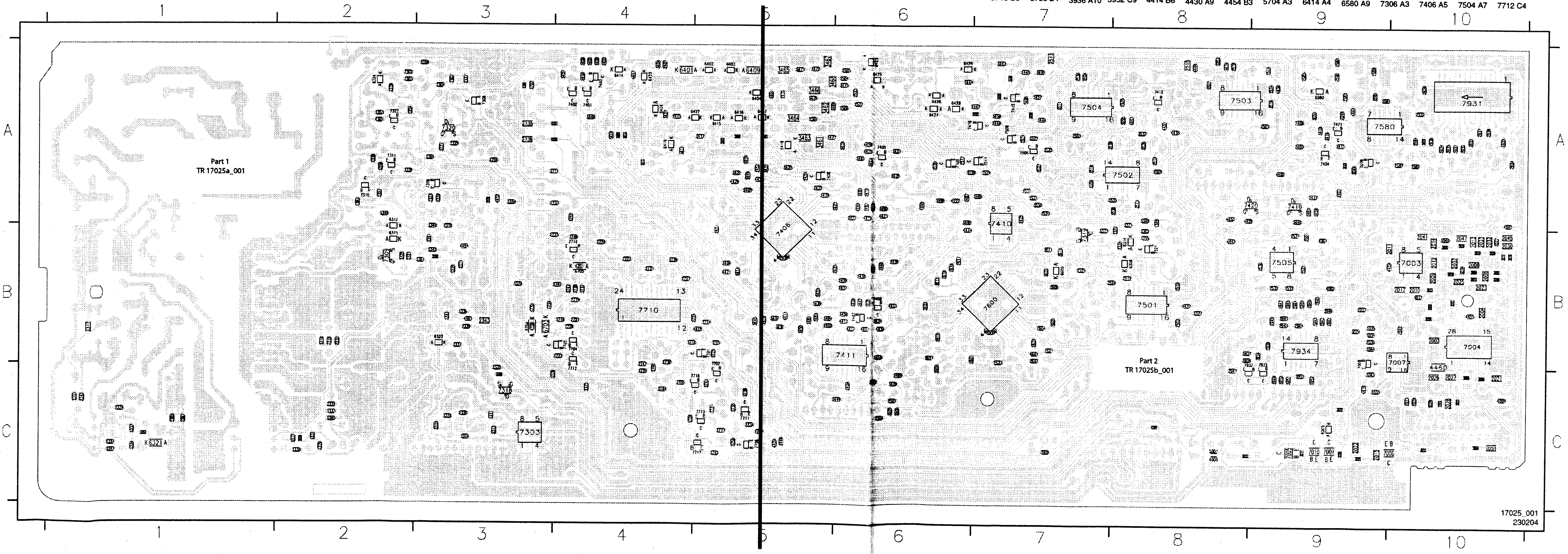
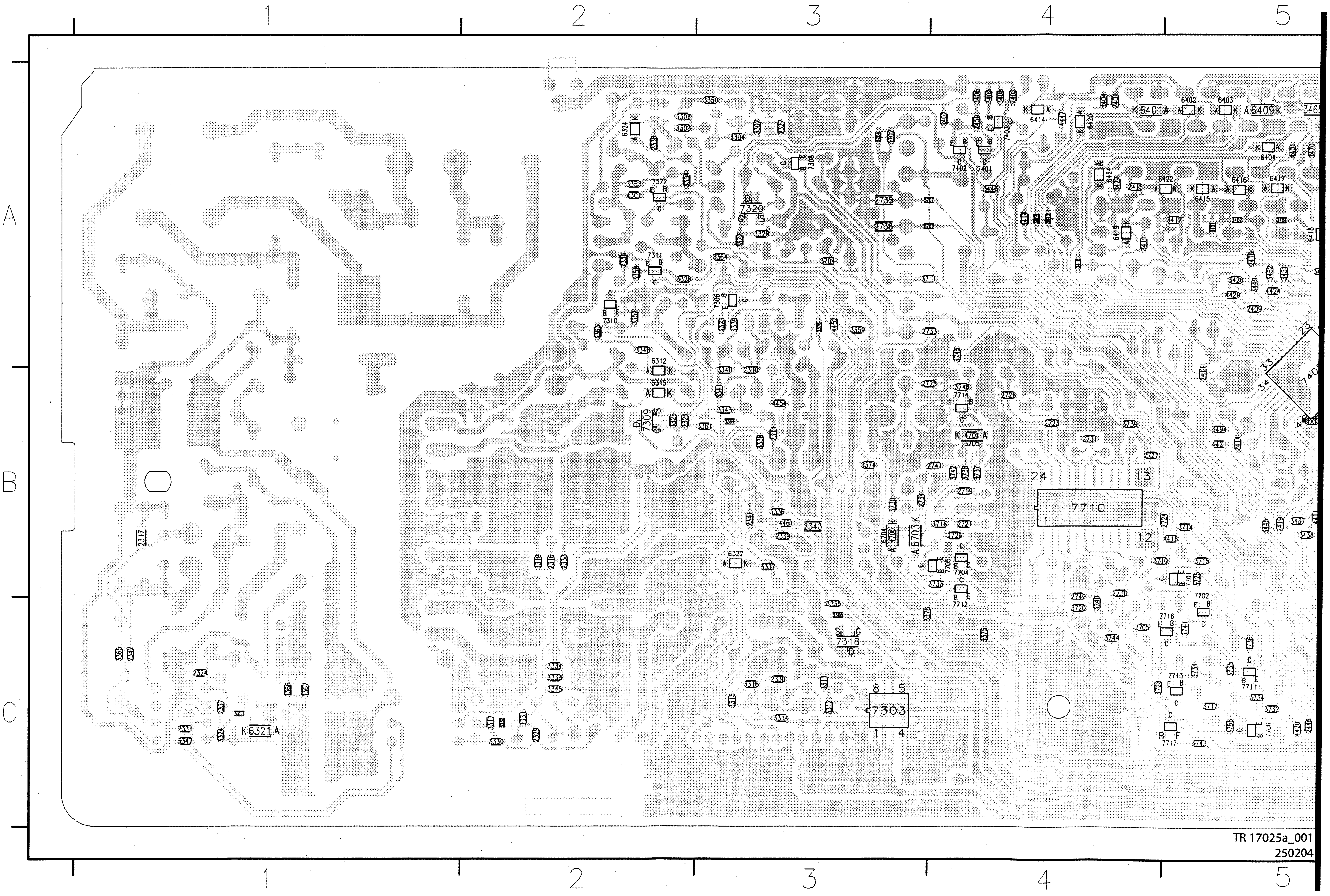
3303	A2
3304	A3
3307	A3
3311	C3
3312	C3
3314	C3
3315	C3
3316	C3
3317	C2
3319	B2
3323	A3
3324	C10
3325	B2
3327	A3
3328	A2
3329	A3
3330	C2
3331	C2
3332	C2
3333	C2
3334	C2
3335	C3
3336	B3
3337	B3
3338	B3
3339	A3
3340	B3
3341	B3
3343	B3
3344	B3
3345	C2
3346	A2
3347	C1
3348	A8
3349	A8
3350	A3
3351	C1
3353	A2
3354	A2
3355	B8
3357	A2
3358	A2
3359	A3
3361	B3
3362	B8
3363	A2
3364	A3
3365	C1
3366	C1
3367	C1
3368	C3
3371	A8
3372	B8
3373	B7
3374	B3
3375	C4
3376	C3
3377	B8
3378	A3
3400	A9
3401	A5
3402	A5
3403	A5
3404	A4
3405	A4
3406	A4
3407	A4
3408	A4
3409	A4
3410	A4
3411	A4
3413	A4
3414	A4
3415	A9
3416	A9
3417	A5
3418	A9
3419	A8
3420	A5
3421	A6
3423	A6
3424	B6
3425	A5
3426	B6
3427	A4
3428	B6
3429	C6
3431	A5
3437	B5
3438	B5
3439	B5
3440	A9
3442	B6
3443	A7
3444	A7
3445	B5
3446	A4
3448	A7
3449	A5
3450	A7
3452	A5
3455	B5
3456	A7
3457	A7
3458	A9
3459	B6
3460	A9
3461	A5
3462	A5
3463	A5
3464	A5
3465	A5
3466	A5
3467	A5
3468	A5
3469	A5
3470	A5
3471	A5
3472	A5
3475	A6
3476	A5
3477	A5
3478	A6
3481	B5
3482	C6
3483	B5
3484	B5
3485	A6
3486	A7
3487	A6
3488	A6
3489	C6
3490	A6
3491	A6
3492	A6
3493	A6
3494	B5
3495	A7
3496	A7
3501	B9
3503	A7
3504	A7
3505	C6
3506	C6
3507	A8
3508	A7
3510	B8
3511	A7
3512	B9
3513	A8
3514	A9
3516	A9
3518	A7
3520	A7
3521	A7
3522	A7
3524	A7
3525	A7
3526	A8
3527	A7
3528	A6
3529	A7
3530	A7
3531	A7
3534	A9
3535	A8
3536	A8
3537	A8
3538	A7
3580	A9
3581	A9
3582	A10
3584	A1
3585	A9
3600	B7
3602	B7
3606	C6
3607	B6
3611	B7
3612	B6
3702	A3
3704	A3
3705	C4
3710	B4
3711	A3
3714	B5
3715	B5
3716	B4
3717	C5
3720	C4
3725	B5
3726	B4
3728	C4
3730	B3
3731	C5
3732	C5
3733	B4
3734	C5
3735	C5
3736	C5
3737	B4
3738	B4
3739	B4
3740	C4
3741	C5
3742	B4
3743	C5
3744	C4
3745	A4
3746	B4
3758	C5
3931	A1
3932	A1
3933	A1
3934	A1
3935	A1
3936	A10
3937	B8
3938	B8
3939	B9
3940	B9
3941	B9
3942	B9
3943	B9
3944	B9
3945	B9
3946	B9
3947	B9
3948	C9
3950	C9
3951	C9
3952	C9
3953	C9
3954	B9
3955	A8
4000	C8
4001	B9
4002	B9
4003	A1
4301	A2
4304	C8
4401	A5
4402	A9
4411	B5
4412	B6
4413	B6
4414	B6
4415	A6
4416	C9
4417	B6
4418	B5
4419	A6
4420	C5
4421	B5
4422	A6
4423	A6
4424	A5
4425	A6
4426	A6
4428	A8
4429	A5
4430	A9
4431	A8
4433	B6
4434	B6
4435	A8
4437	B8
4442	B8
4443	A8
4444	A9
4446	A8
4447	A4
4448	A6
4449	A6
4452	A3
4453	A8
4454	B3
4455	B10
4459	B10
4460	B10
4461	B3
4601	B7
4700	B3
4701	B4
4999	C10
5001	C8
5002	B10
5405	A7
5407	A7
5701	A3
5702	A3
5704	A3
5932	A1
6005	C9
6312	A2
6314	B8
6315	B2
6320	B8
6321	C1
6322	B3
6324	A2
6401	A4
6402	A5
6403	A5
6404	A5
6409	A5
6414	A4
6415	A5
6416	A5
6417	A5
6418	A5
6419	A4
6420	A4
6422	A5
6423	A6
6424	A4
6425	A6
6426	A6
6427	A6
6428	A6
6429	A6
6580	A9
6600	B7
6703	B3
6704	B3
6705	B4
7001	C9
7003	B10
7004	B10
7005	C9
7006	C10
7007	B10
7008	B9
7009	A9
7010	C9
7303	C3
7306	A3
7308	A3
7309	B2
7310	A2
7311	A2
7318	C3
7319	B7
7320	A3
7321	B8
7322	A2
7401	A4
7402	A4
7403	A4
7404	A9
7405	A6
7406	A5
7407	B6
7408	B5
7409	B6
7410	A7
7411	B6
7412	A8
7415	A7
7416	A6
7419	A9
7420	A9
7421	A9
7501	B8
7502	A8
7503	A8
7504	A7
7505	B9
7506	A7
7508	A7
7509	A6
7511	A7
7580	A9
7600	B7
7701	B5
7702	B5
7704	B4
7705	B4
7706	C5
7710	B4
7711	C5
7712	C4
7713	C5
7714	B4
7716	C5
7717	C5
7931	A10
7932	B8
7933	B9
7934	B9



Layout Analog Board (Part 1 Bottom View)


1
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A
B
C
7320
7309
7318
7303
7710
7401
7402
7403
7308
7306
7310
7311
7322
7704
7705
7712
7714
7701
7702
7711
7713
7716
7717
7706
6324
6312
6315
6322
6321
6401
6402
6403
6409
6404
6414
6420
6415
6416
6417
6419
6421
6422
6703
6704
6705
2317
2343
2735
2736
24
13
12
1
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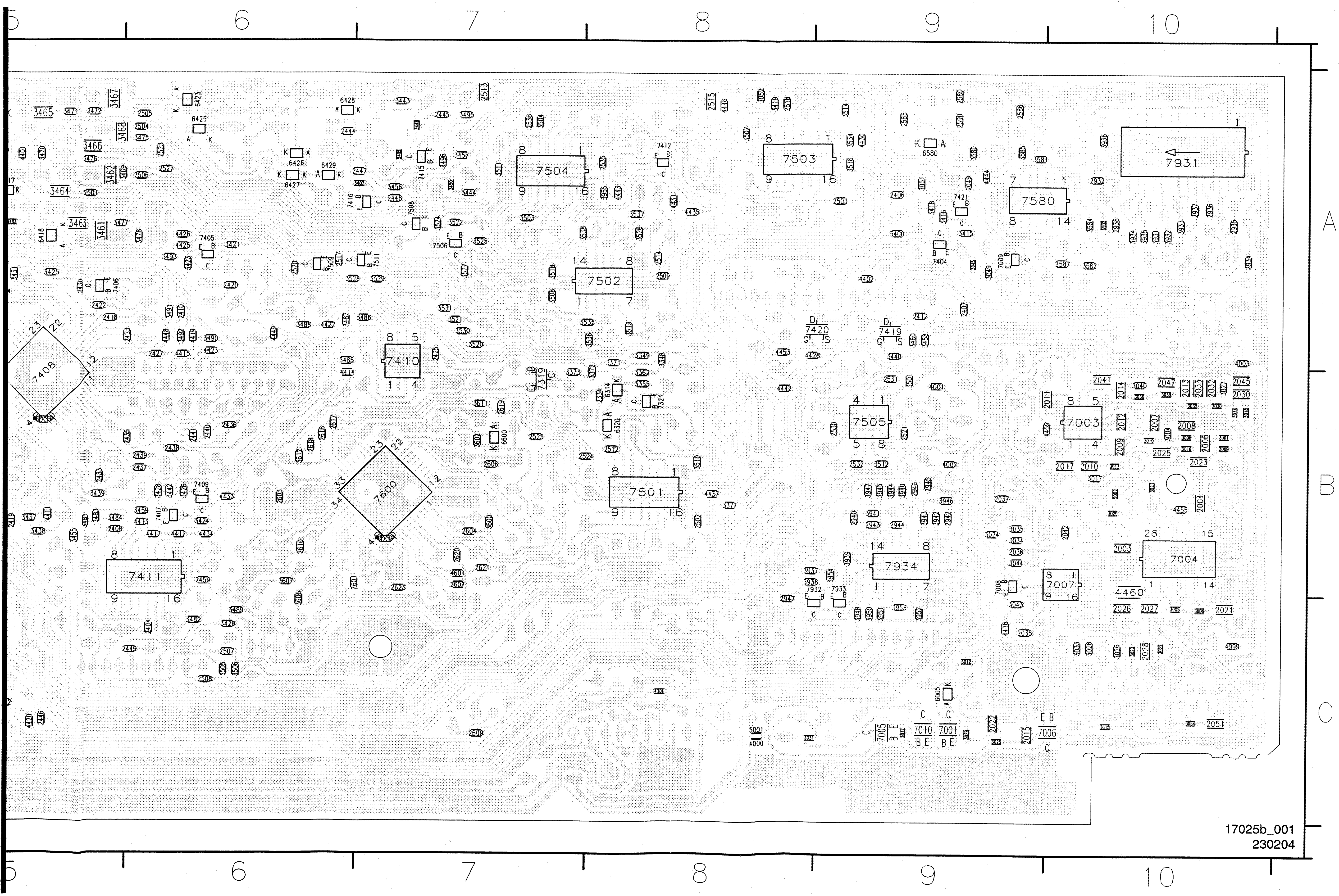
33
34
TR 17025a_001
250204

Layout Analog Board (Part 2 Bottom View)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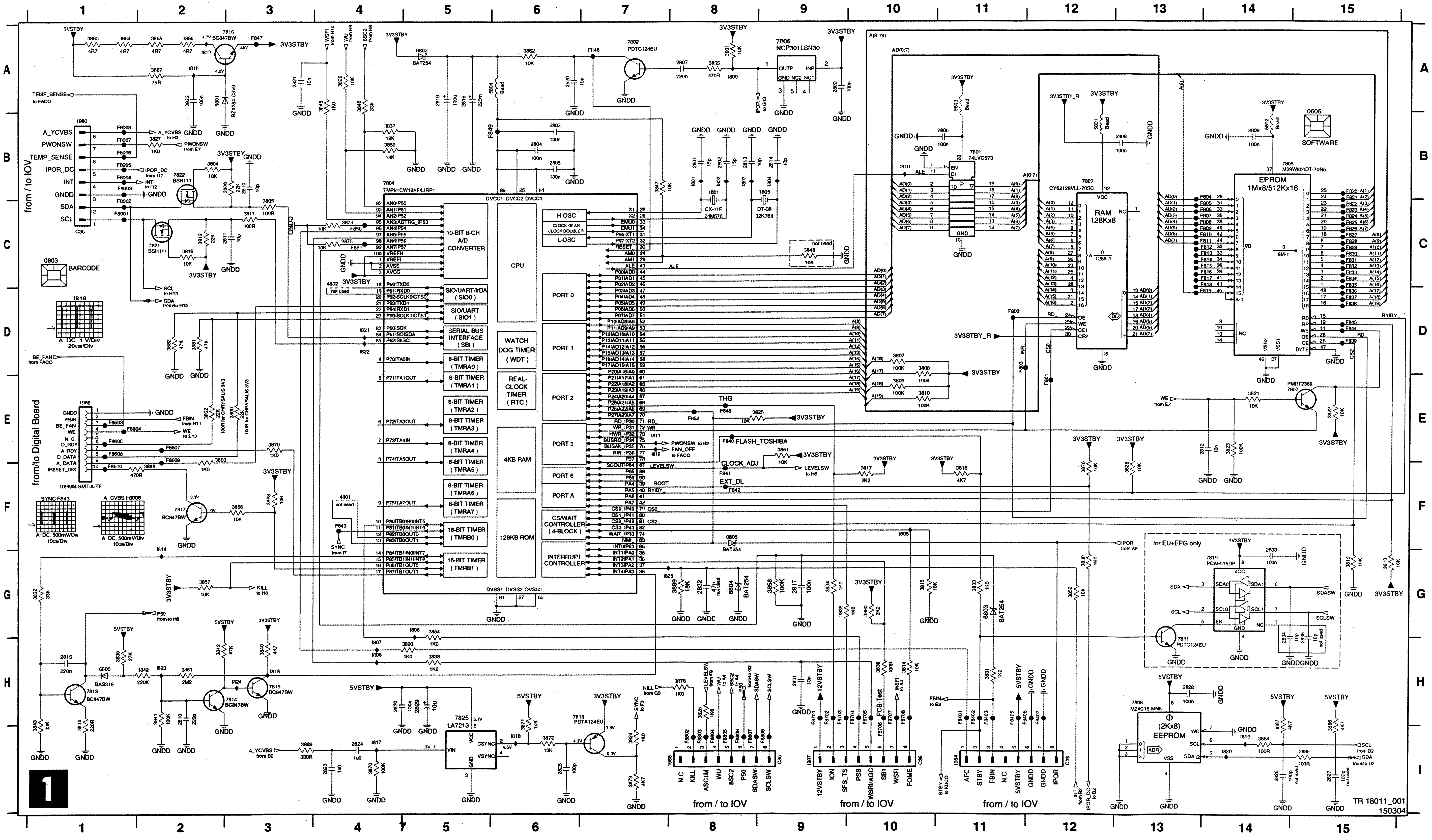
A
B
C
7931
7503
7504
7580
7502
7410
7408
7505
7003
7501
7600
7411
7934
7004
7007
7420
7419
7010
7001
7006
7005
17025b_001
230204

UP Sub Board: Central Controller (CECO)

0606 B15
1801 B8
1805 B9
1980 B1
1984 I11
1986 E1
1987 I9
1988 I8
2800 A9
2801 B8
2802 B8
2803 B6
2804 B6
2805 B6
2806 B11
2807 A8
2808 B13
2809 B14
2810 B3
2811 C3
2812 E14
2813 B8
2814 B9
2815 H1
2816 A5
2817 G9
2818 H2
2819 A5
2820 A6
2821 A3
2822 A2
2823 I4
2824 I4
2825 I6
2826 I14
2827 I15
2828 H13
2829 H5
2830 H4
2831 H9
2832 G8
2833 G14
2834 H14
2835 H15
3800 E2
3801 A8
3802 E1
3803 E2
3804 B2
3805 C3
3806 B3
3807 D10
3808 D10
3809 E10
3810 E10
3811 C3
3812 C2
3813 G15
3814 H10
3815 G10
3816 C2
3817 F10
3818 F11
3819 G15
3820 H5
3821 E14
3822 E15
3823 E14
3824 I7
3825 E8
3826 H8
3827 B2
3828 F13
3829 A4
3830 G12
3831 H11
3832 G1
3833 G11
3834 G9
3835 G9
3836 H10
3837 B4
3838 H5
3839 H1
3840 H3
3841 H2
3842 H2
3843 I1
3844 I1
3845 A4
3846 A4
3847 B7
3848 C9
3849 H2
3850 B4
3851 E9
3852 G12
3854 G5
3855 A8
3856 F3
3857 G2
3858 G9
3860 G10
3861 H2
3862 A6
3863 A1
3864 A1
3865 A2
3866 A2
3867 A2
3868 F3
3869 I3
3870 I4
3871 I6
3872 I6
3873 I7
3874 C4
3875 C4
3876 F12
3878 H8
3879 E2
3881 D2
3882 D2
3884 I14
3885 I15
3886 I15
3887 I14
3888 F2
3889 G8
4801 F4
4802 C4
5801 B12
5802 B14
5803 A11
5804 A6
6800 H1
6801 A2
6802 A5
6803 G11
6804 G8
6805 F8
7801 B11
7802 A7
7803 B12
7804 B4
7805 B14
7806 A9
7807 E15
7808 H13
7810 G14
7811 H13
7813 H1
7814 H3
7815 H3
7816 A3
7817 F2
7818 H6
7821 C2
7822 B2
7825 H5
F8001 C1
F8002 C1
F8003 B1
F8004 B1
F8005 B1
F8006 B1
F8007 B1
F8008 B1
F801 E12
F802 D11
F803 D11
F804 B14
F805 C14
F806 C14
F807 C14
F808 C14
F809 C14
F810 C14
F811 C14
F812 C14
F813 C14
F814 C14
F815 C14
F816 C14
F817 C14
F818 C14
F819 D14
F820 B15
F821 B15
F822 C15
F823 C15
F824 C15
F825 C15
F826 C15
F827 C15
F828 C15
F829 C15
F830 C15
F831 C15
F832 C15
F833 C15
F834 C15
F835 C15
F836 D15
F837 D15
F838 D15
F839 D15
F840 E8
F8401 H11
F8402 H11
F8403 H11
F8405 H11
F8406 H12
F8407 H12
F841 F8
F842 F8
F843 F4
F844 D15
F845 D15
F846 A7
F847 A3
F848 E8
F849 B6
F850 C4
F851 C4
F852 E8
F8603 E1
F8604 E1
F8606 E1
F8607 E2
F8608 E1
F8609 E2
F8610 F1
F8701 H9
F8702 H9
F8703 H9
F8704 H10
F8705 H10
F8706 I10
F8707 H10
F8708 H10
F8802 I8
F8803 I8
F8804 I8
F8805 I8
F8806 I8
F8807 I8
F8808 I9
I801 B8
I802 B8
I803 B8
I804 B9
I805 F10
I806 G5
I807 H4
I808 H4
I809 A8
I810 B10
I811 E7
I812 E7
I813 A2
I814 F2
I815 H3
I816 A2
I817 I4
I818 I6
I819 I14
I820 I14
I821 D4
I822 D4
I823 H2
I824 H3
I825 G7



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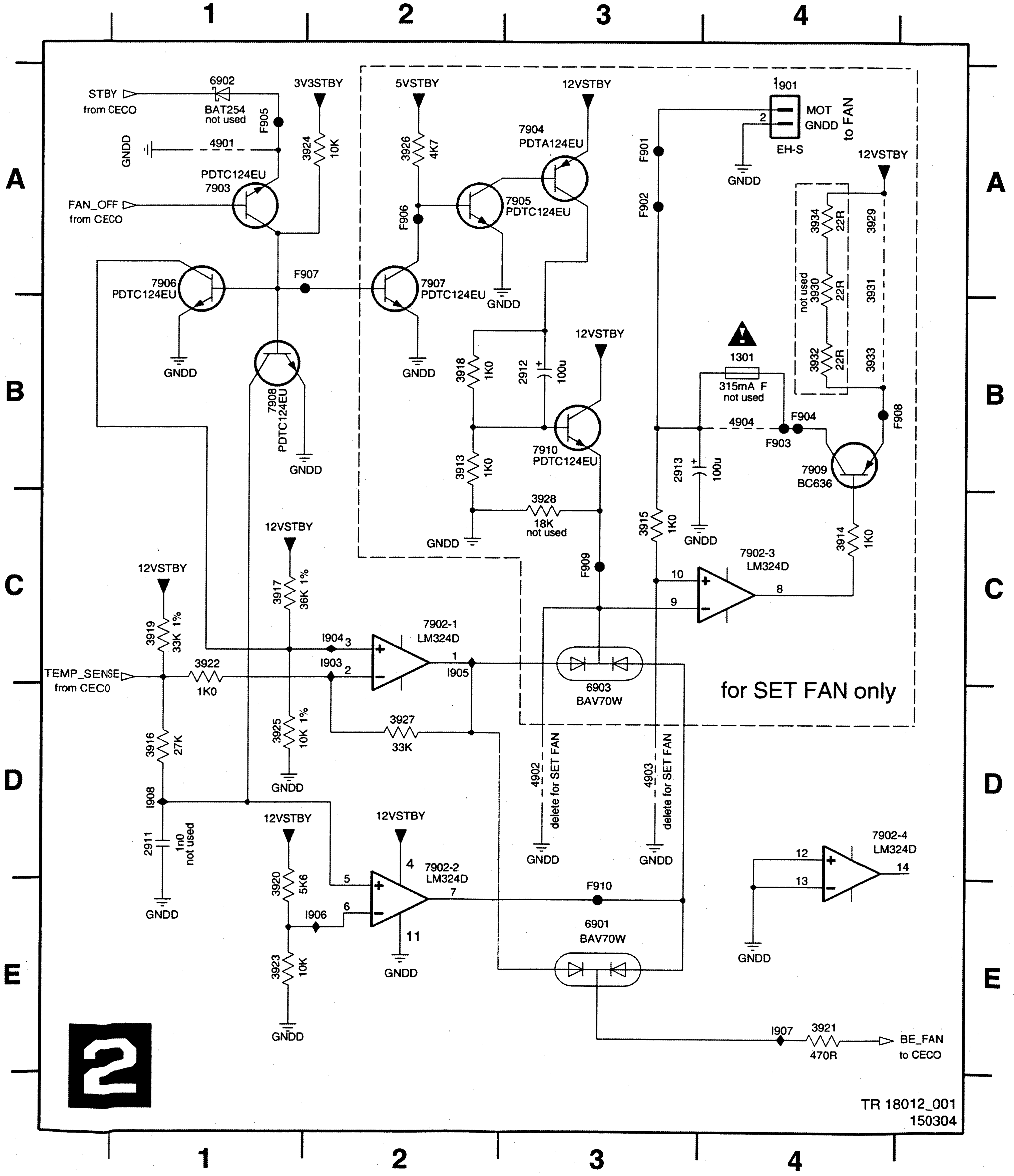
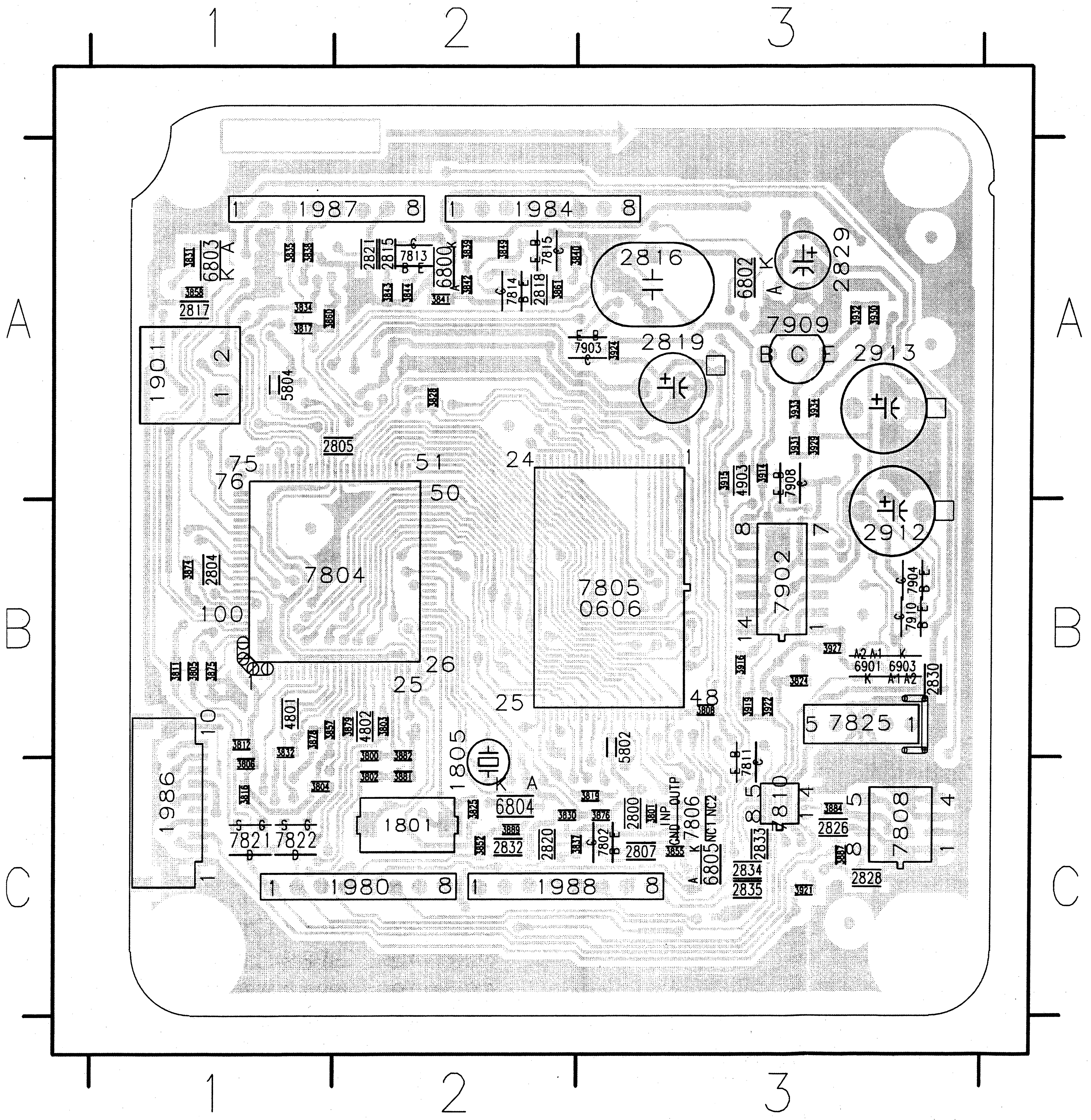
11
12
13
14
15
A
B
C
D
E
F
G
H
I
5VSTBY
3V3STBY
7804 TMP91CW12AF/LIRP1
10-BIT 8-CH A/D CONVERTER
CPU
H-OSC
CLOCK GEAR CLOCK DOUBLER
L-OSC
PORT 0
PORT 1
PORT 2
PORT 3
PORT 6
PORT A
SIO/UART/IrDA (SIO0)
SIO/UART (SIO1)
SERIAL BUS INTERFACE (SBI)
WATCH DOG TIMER (WDT)
REAL-CLOCK TIMER (RTC)
4KB RAM
128KB ROM
CS/WAIT CONTROLLER (4-BLOCK)
INTERRUPT CONTROLLER
8-BIT TIMER (TMRA0)
8-BIT TIMER (TMRA1)
8-BIT TIMER (TMRA2)
8-BIT TIMER (TMRA3)
8-BIT TIMER (TMRA4)
8-BIT TIMER (TMRA5)
8-BIT TIMER (TMRA6)
8-BIT TIMER (TMRA7)
16-BIT TIMER (TMRB0)
16-BIT TIMER (TMRB1)
7806 NCP301LSN30
7801 74LVC573
7803 CY62128VLL-70SC
RAM 128Kx8
7805 M29W800DT-70N6
EPROM 1Mx8/512Kx16
0606 SOFTWARE
0803 BARCODE
7810 PCA9515DP
for EU+EPG only
7808 M24C16-MN6
(2Kx8) EEPROM
7825 LA7213
7802 PDTC124EU
7811 PDTC124EU
7807 PMBT2369
7816 BC847BW
7817 BC847BW
7813 BC847BW
7814 BC847BW
7815 BC847BW
7818 PDTA124EU
7821 BSH111
7822 BSH111
1801 CX-11F 24M576
1805 DT-38 32K768
FLASH_TOSHIBA
from / to IOV
from/to Digital Board
from / to IOV
from / to IOV
from / to IOV
A: DC 1 V/Div 20us/Div
A: DC 500mV/Div 10us/Div
TR 18011_001 150304

UP Sub Board: Fan Control (FACO)

1301	B4	3915	C3	3922	C1	3929	A4	4902	D3	7902-2	D2	7907	A2	F904	B4	I903	C2
1901	A4	3916	D1	3923	E1	3930	A4	4903	D3	7902-3	C4	7908	B1	F905	A1	I904	C2
2911	D1	3917	C1	3924	A2	3931	A4	4904	B4	7902-4	D4	7909	B4	F906	A2	I905	C2
2912	B3	3918	B2	3925	D1	3932	B4	6901	E3	7903	A1	7910	B3	F907	A1	I906	E2
2913	B3	3919	C1	3926	A2	3933	B4	6902	A1	7904	A3	F901	A3	F908	B4	I907	E4
3913	B2	3920	E1	3927	D2	3934	A4	6903	C3	7905	A3	F902	A3	F909	C3	I908	D1
3914	C4	3921	E4	3928	C3	4901	A1	7902-1	C2	7906	A1	F903	B4	F910	E3		


1
2
3
4
A
B
C
D
E
STBY
from CECO
6902
BAT254
not used
F905
3V3STBY
3924
10K
GNDD
4901
PDTC124EU
7903
FAN_OFF
from CECO
7906
PDTC124EU
F907
7908
PDTC124EU
5VSTBY
3926
4K7
F906
7905
PDTC124EU
7907
PDTC124EU
12VSTBY
7904
PDTA124EU
3918
1K0
2912
100u
3913
1K0
7910
PDTC124EU
3928
18K
not used
F909
1901
MOT
GNDD
to FAN
EH-S
F901
F902
3934
22R
3929
not used
3930
22R
3931
3932
22R
3933
1301
315mA F
not used
4904
F904
F903
F908
2913
100u
7909
BC636
3915
1K0
3914
1K0
7902-3
LM324D
10
9
8
3917
36K 1%
3919
33K 1%
TEMP_SENSE
from CECO
3922
1K0
I904
I903
3
2
7902-1
LM324D
1
I905
6903
BAV70W
for SET FAN only
3927
33K
3916
27K
3925
10K 1%
I908
2911
1n0
not used
4902
delete for SET FAN
4903
delete for SET FAN
3920
5K6
I906
3923
10K
5
6
4
11
7902-2
LM324D
7
F910
6901
BAV70W
7902-4
LM324D
12
13
14
I907
3921
470R
BE_FAN
to CECO
2
TR 18012_001
150304

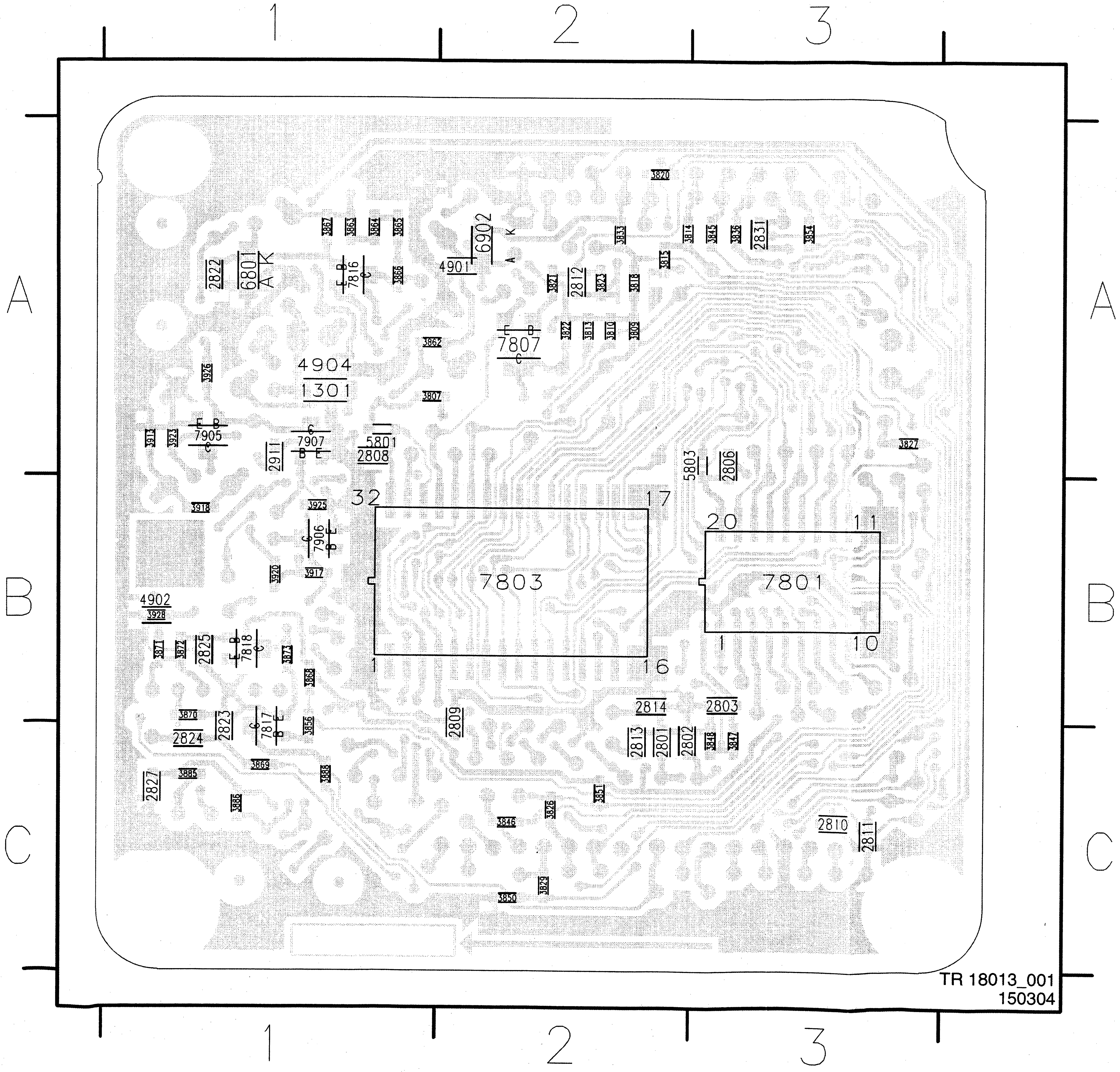
Layout UP Sub Board (Top View)


1
2
3
A
B
C
1987
1984
1980
1988
1986
1901
1801
1805
7804
7805
0606
7902
7825
7808
7806
7810
2816
2819
2829
2913
2912
7909
6800
6802
6803
6804
6805
6901
6903
5802
5804
4801
4802
4903
7813
7814
7815
7903
7908
7904
7910
7811
7802
7821
7822
2800
2804
2805
2807
2815
2817
2818
2820
2821
2826
2828
2830
2832
2833
2834
2835

0606	B3	3819	C3	3929	A3
1801	C2	3824	B3	3930	A3
1805	C2	3825	C2	3931	A3
1901	A1	3828	A2	3932	A3
1980	C2	3830	C2	3933	A3
1984	A2	3831	A1	3934	A3
1986	C1	3832	B1	4801	B1
1987	A1	3834	A1	4802	B2
1988	C2	3835	A1	4903	A3
2800	C3	3837	C2	5802	B3
2804	B1	3838	A1	5804	A1
2805	A2	3839	A2	6800	A2
2807	C3	3840	A2	6802	A3
2815	A2	3841	A2	6803	A1
2816	A3	3842	A2	6804	C2
2817	A1	3843	A2	6805	C3
2818	A2	3844	A2	6901	B3
2819	A3	3849	A2	6903	B3
2820	C2	3852	C2	7802	C3
2821	A2	3855	C3	7804	B2
2826	C3	3857	B1	7805	B3
2828	C3	3858	A1	7806	C3
2829	A3	3860	A1	7808	C3
2830	B3	3861	A2	7810	C3
2832	C2	3874	B1	7811	C3
2833	C3	3875	B1	7813	A2
2834	C3	3876	C3	7814	A2
2835	C3	3878	B1	7815	A2
2912	B3	3879	B2	7821	C1
2913	A3	3881	C2	7822	C1
3800	B2	3882	B2	7825	B3
3801	C3	3884	C3	7902	B3
3802	C2	3887	C3	7903	A3
3803	B2	3889	C2	7904	B3
3804	C1	3914	A3	7908	A3
3805	B1	3915	A3	7909	A3
3806	C1	3916	B3	7910	B3
3808	B3	3919	B3		
3811	B1	3921	C3		
3812	B1	3922	B3		
3816	C1	3924	A3		
3817	A1	3927	B3		

TR 06012_001
040203

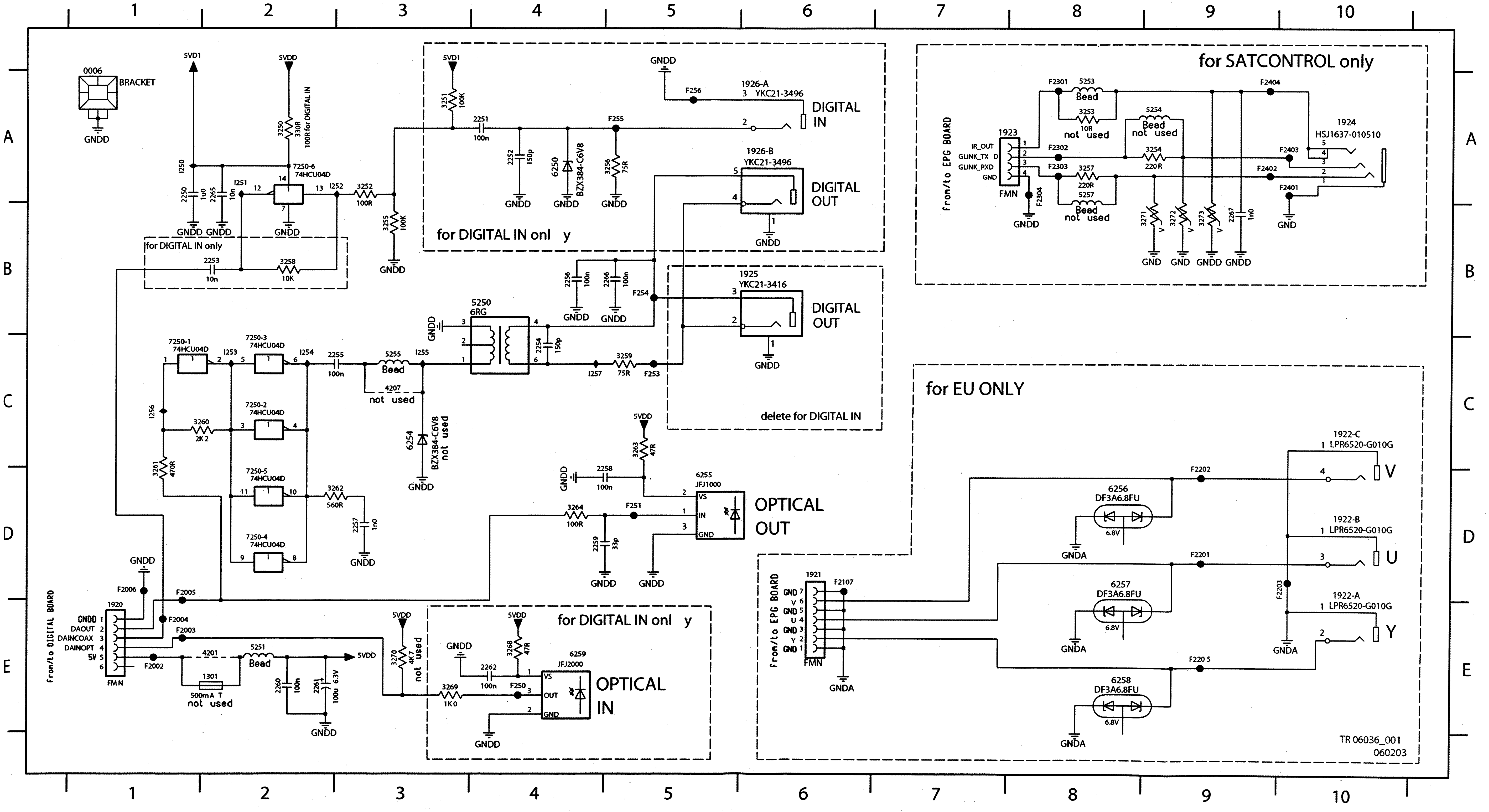
Layout UP Sub Board (Bottom View)


1
2
3
A
B
C
7803
7801
32
17
1
16
20
11
10
4904
1301
2822
6801
A K
7816
4901
6902
7807
7905
7907
5801
2808
2911
5803
2806
7906
4902
3928
2825
7818
2824
2823
7817
2827
2809
2814
2803
2813
2801
2802
2810
2811
2812
2831
TR 18013_001
150304

1301	A1
2801	C2
2802	C2
2803	B3
2806	A3
2808	A1
2809	B2
2810	C3
2811	C3
2812	A2
2813	C2
2814	B2
2822	A1
2823	C1
2824	C1
2825	B1
2827	C1
2831	A3
2911	A1
3807	A1
3809	A2
3810	A2
3813	A2
3814	A2
3815	A2
3818	A2
3820	A2
3821	A2
3822	A2
3823	A2
3826	C2
3827	A3
3829	C2
3833	A2
3836	A3
3845	A3
3846	C2
3847	C3
3848	C3
3850	C2
3851	C2
3854	A3
3856	C1
3862	A1
3863	Al
3864	A1
3865	A1
3866	A1
3867	A1
3868	B1
3869	C1
3870	B1
3871	B1
3872	B1
3873	B1
3885	C1
3886	C1
3888	C1
3913	A1
3917	B1
3918	B1
3920	B1
3923	A1
3925	B1
3926	A1
3928	B1
4901	A2
4902	B1
4904	A1
5801	A1
5803	A2
6801	A1
6902	A2
7801	B3
7803	B2
7807	A2
7816	A1
7817	C1
7818	B1
7905	A1
7906	B1
7907	A1

In/Out Extension Board IOE

0006 A1	1922-C C10	2250 A1	2256 B4	2262 E4	3252 A3	3258 B2	3264 D4	3273 B9	5254 A9	6256 D8	7250-3 C2	F2004 E1	F2203 D10	F2401 A10	F253 C5	I252 A3
1301 E2	1923 A8	2251 A4	2257 D3	2265 A2	3253 A8	3259 C5	3268 E4	4201 E2	5255 C3	6257 D8	7250-4 D2	F2005 D1	F2205 E9	F2402 A9	F254 B5	I253 C2
1920 E1	1924 A10	2252 A4	2258 D5	2266 B5	3254 A9	3260 C2	3269 E3	4207 C3	5257 A8	6258 E8	7250-5 D2	F2006 D1	F2301 A8	F2403 A10	F255 A5	I254 C2
1921 D6	1925 B5	2253 B2	2259 D4	2267 B9	3255 B3	3261 D1	3270 E3	5250 B4	6250 A4	6259 E4	7250-6 A2	F2107 D6	F2302 A8	F2404 A9	F256 A5	I255 C3
1922-A D10	1926-A A6	2254 C4	2260 E2	3250 A2	3256 A5	3262 D3	3271 B9	5251 E2	6254 C3	7250-1 C1	F2002 E1	F2201 D9	F2303 A8	F250 E4	I250 A1	I256 C1
1922-B D10	1926-B A6	2255 C3	2261 E2	3251 A3	3257 A8	3263 C5	3272 B9	5253 A8	6255 D5	7250-2 C2	F2003 E1	F2202 D9	F2304 A8	F251 D5	I251 A2	I257 C4


1
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7
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9
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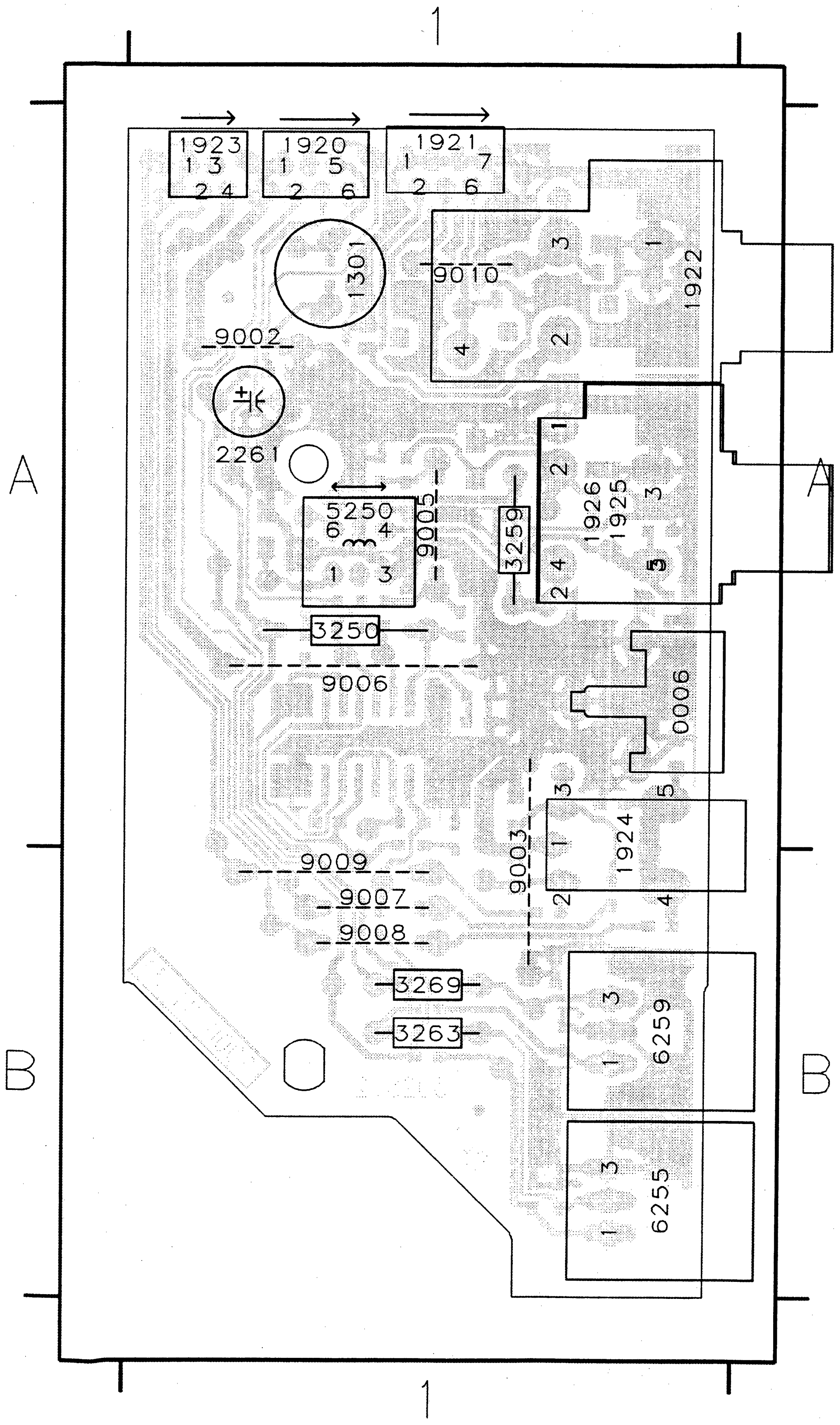
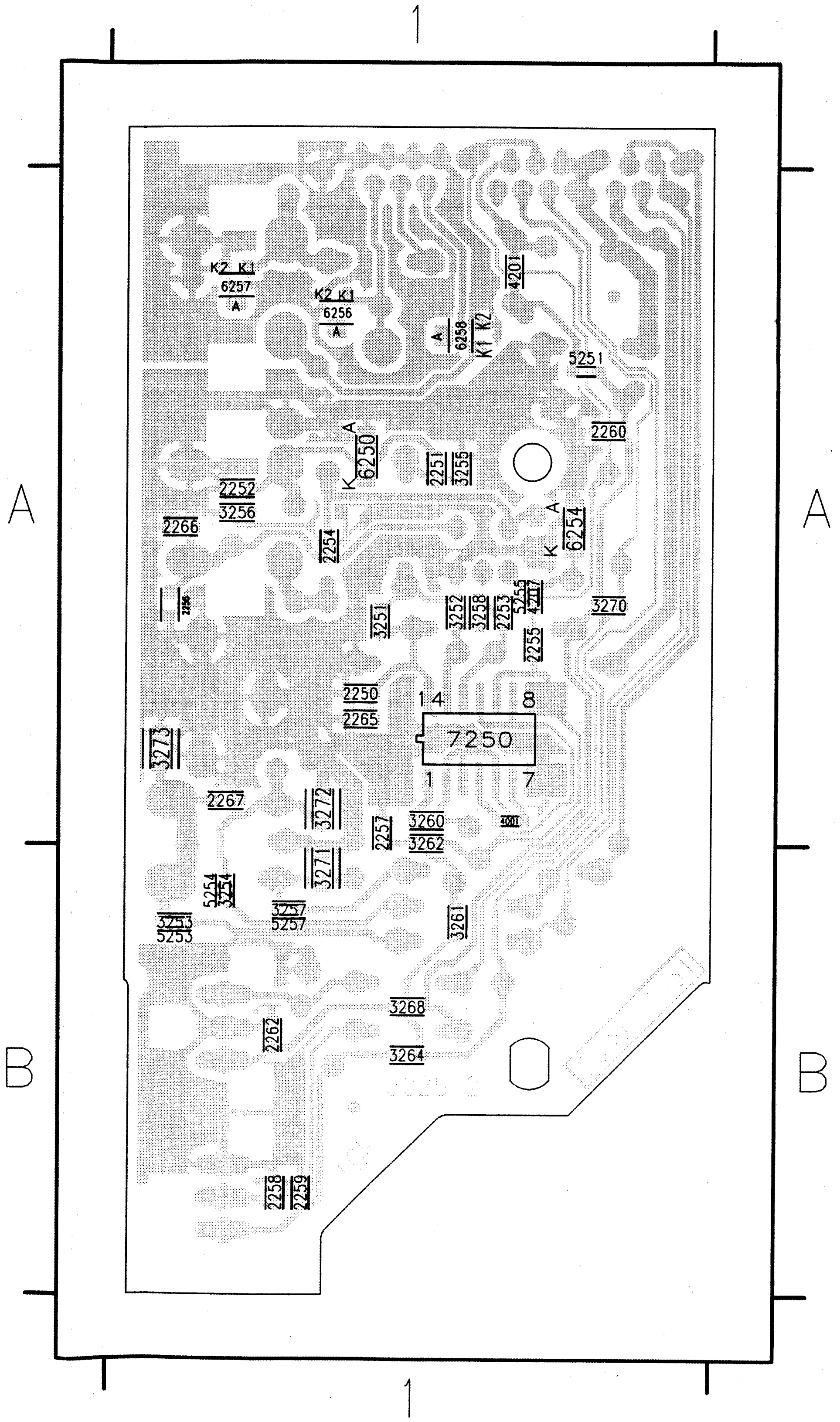
A
B
C
D
E
0006
BRACKET
GNDD
5VD1
5VDD
3250 330R 100R for DIGITAL IN
I250
2250 1u0
2265 10n
I251
7250-6 74HCU04D
I252
3252 100R
3255 100K
for DIGITAL IN only
2253 10n
3258 10K
5VD1
3251 100K
2251 100n
2252 150p
6250 BZX384-C6V8
3256 75R
F255
F256
GNDD
1926-A 3 YKC21-3496
DIGITAL IN
1926-B YKC21-3496
DIGITAL OUT
for DIGITAL IN onl y
2256 100n
2266 100n
F254
1925 YKC21-3416
DIGITAL OUT
delete for DIGITAL IN
5250 6RG
2254 150p
3259 75R
I257
F253
7250-1 74HCU04D
I253
7250-3 74HCU04D
I254
2255 100n
5255 Bead
I255
4207 not used
6254 BZX384-C6V8 not used
I256
3260 2K2
7250-2 74HCU04D
3261 470R
7250-5 74HCU04D
3262 560R
2257 1n0
7250-4 74HCU04D
5VDD
3263 47R
2258 100n
6255 JFJ1000
VS IN GND
OPTICAL OUT
3264 100R
F251
2259 33p
GNDD
F2006
F2005
F2004
F2003
F2002
1920
GNDD 1
DAOUT 2
DAINCOAX 3
DAINOPT 4
5V 5
6
FMN
from/to DIGITAL BOARD
4201
1301 500mA T not used
5251 Bead
2260 100n
2261 100u 6.3V
5VDD
for DIGITAL IN onl y
3270 4K7 not used
3269 1K0
2262 100n
3268 47R
F250
6259 JFJ2000
VS OUT GND
OPTICAL IN
for SATCONTROL only
F2301
5253 Bead
3253 10R not used
5254 Bead not used
F2404
1924 HSJ1637-010510
1923
IR_OUT 1
GLINK_TX 2
GLINK_RXD 3
GND 4
FMN
from/to EPG BOARD
F2302
F2303
3254 220R
3257 220R
5257 Bead not used
F2304
F2403
F2402
F2401
3271
3272
3273
2267 1n0
GND
for EU ONLY
1922-C 1 LPR6520-G010G
V
F2202
6256 DF3A6.8FU 6.8V
GNDA
1922-B 1 LPR6520-G010G
U
F2201
6257 DF3A6.8FU 6.8V
F2203
1922-A 1 LPR6520-G010G
Y
1921
F2107
GND 7
V 6
GND 5
U 4
GND 3
Y 2
GND 1
from/to EPG BOARD
F220 5
6258 DF3A6.8FU 6.8V
TR 06036_001
060203

Layout In / Out Extension Board


1
1923
1920
1921
1922
1301
9010
9002
2261
5250
9005
3259
1926
1925
3250
9006
0006
1924
9003
9009
9007
9008
3269
3263
6259
6255
A
B

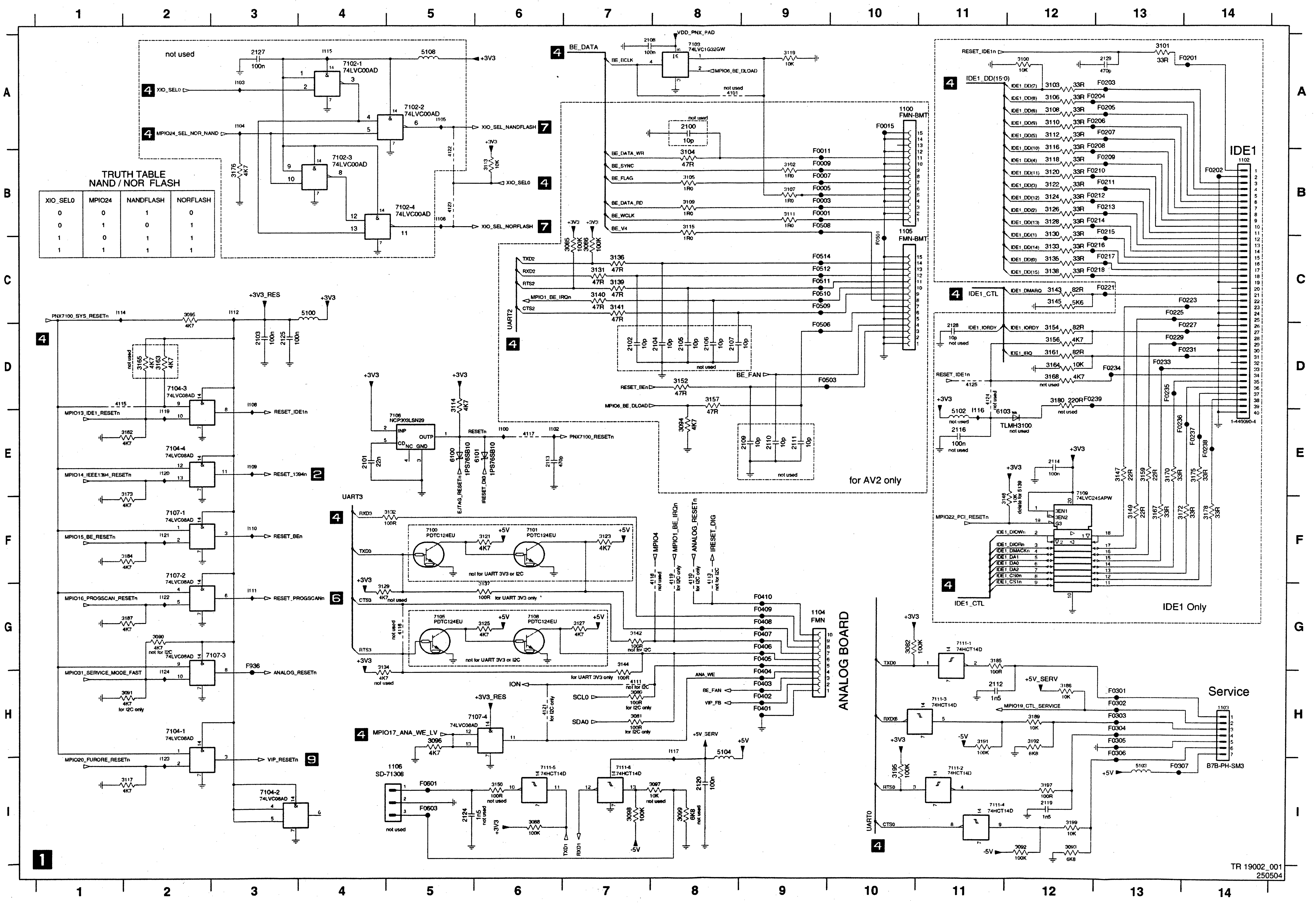
0006	A1
1301	A1
1920	A1
1921	A1
1922	A1
1923	A1
1924	A1
1925	A1
1926	A1
2261	A1
3250	A1
3259	A1
3263	B1
3269	B1
5250	A1
6255	B1
6259	B1
9002	A1
9003	B1
9005	A1
9006	A1
9007	B1
9008	B1
9009	B1
9010	A1


1
6257
6256
6258
4201
5251
2260
6250
2251
3255
6254
2252
3256
2266
2254
3270
3251
3252
3258
2253
5255
4207
2255
2250
2265
7250
3273
2267
3272
2257
3260
3262
4001
3271
5254
3257
5257
3253
5253
3261
3268
2262
3264
2258
2259
A
B

2250	A1
2251	A1
2252	A1
2253	A1
2254	A1
2255	A1
2256	A1
2257	A1
2258	B1
2259	B1
2260	A1
2262	B1
2265	A1
2266	A1
2267	A1
3251	A1
3252	A1
3253	B1
3254	B1
3255	A1
3256	A1
3257	B1
3258	A1
3260	A1
3261	B1
3262	A1
3264	B1
3268	B1
3270	A1
3271	B1
3272	A1
3273	A1
4001	A1
4201	A1
4207	A1
5251	A1
5253	B1
5254	B1
5255	A1
5257	B1
6250	A1
6254	A1
6256	A1
6257	A1
6258	A1
7250	A1

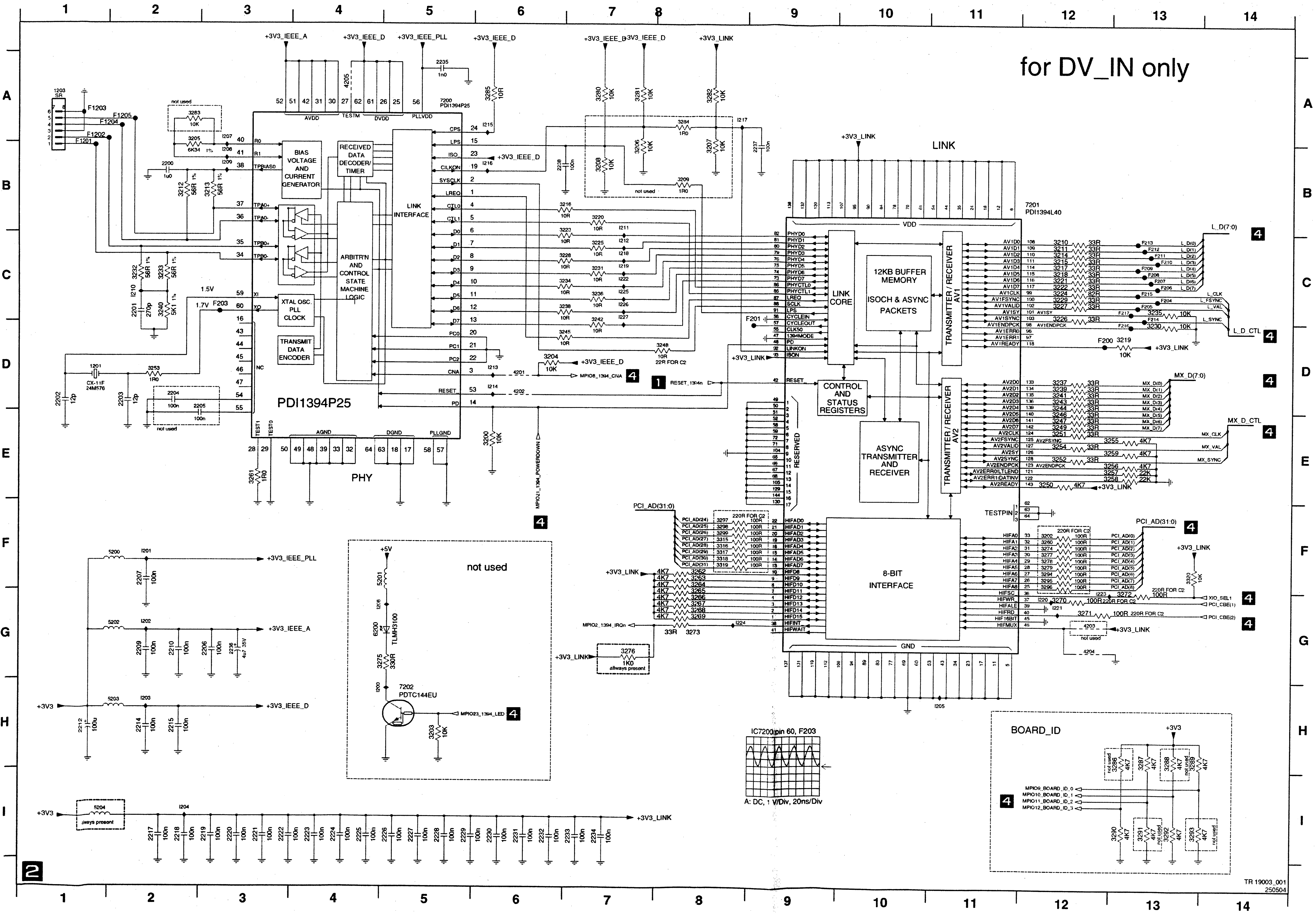
TR 06037_00 1
06020 3

Digital Board Chrysalis 2.1: IDE, UARTS, RESET, BE


not used
TRUTH TABLE NAND / NOR FLASH
XIO_SEL0 | MPIO24 | NANDFLASH | NORFLASH
0 0 1 0
0 1 0 1
1 0 1 1
1 1 1 1
XIO_SEL0
MPIO24_SEL_NOR_NAND
7102-1 74LVC00AD
7102-2 74LVC00AD
7102-3 74LVC00AD
7102-4 74LVC00AD
XIO_SEL_NANDFLASH
XIO_SEL_NORFLASH
BE_DATA
VDD_PNX_PAD
7103 74LVC1G32GW
MPIO6_BE_DLOAD
BE_BCLK
BE_DATA_WR
BE_SYNC
BE_FLAG
BE_DATA_RD
BE_WCLK
BE_V4
1100 FMN-BMT
1105 FMN-BMT
UART2
TXD2
RXD2
RTS2
MPIO1_BE_IRQn
CTS2
BE_FAN
RESET_BEn
MPIO6_BE_DLOAD
for AV2 only
PNX7100_SYS_RESETn
+3V3_RES
7104-3 74LVC08AD
MPIO13_IDE1_RESETn
RESET_IDE1n
7104-4 74LVC08AD
MPIO14_IEEE1394_RESETn
RESET_1394n
7107-1 74LVC08AD
MPIO15_BE_RESETn
RESET_BEn
7107-2 74LVC08AD
MPIO16_PROGSCAN_RESETn
RESET_PROGSCANn
7107-3 74LVC08AD
MPIO31_SERVICE_MODE_FAST
ANALOG_RESETn
7104-1 74LVC08AD
MPIO20_FURORE_RESETn
VIP_RESETn
7104-2 74LVC08AD
7106 NCP303LSN29
RESETn
PNX7100_RESETn
EJTAG_RESETn
IRESET_DIG
UART3
RXD3
TXD3
CTS3
RTS3
7100 PDTC124EU
7101 PDTC124EU
7105 PDTC124EU
7108 PDTC124EU
not for UART 3V3 or I2C
for UART 3V3 only
MPIO4
MPIO1_BE_IRQn
ANALOG_RESETn
IRESET_DIG
1104 FMN
ANALOG BOARD
ION
SCL0
SDA0
ANA_WE
ANA_FAN
VIP_FB
+3V3_RES
7107-4 74LVC08AD
MPIO17_ANA_WE_LV
1106 SD-71308
7111-5 74HCT14D
7111-6 74HCT14D
+5V_SERV
TXD1
RXD1
RESET_IDE1n
IDE1_DD(15:0)
IDE1
1102
IDE1_CTL
IDE1_DMARQ
IDE1_IORDY
IDE1_IRQ
TLMH3100
7109 74LVC245APW
MPIO22_PCI_RESETn
IDE1_DIOWn
IDE1_DIORn
IDE1_DMACKn
IDE1_DA1
IDE1_DA0
IDE1_DA2
IDE1_CS0n
IDE1_CS1n
IDE1 Only
1-440090-4
UART0
TXD0
RXD0
RTS0
CTS0
7111-1 74HCT14D
7111-3 74HCT14D
7111-2 74HCT14D
7111-4 74HCT14D
MPIO19_CTL_SERVICE
Service
1103
B7B-PH-SM3
TR 19002_001
250504

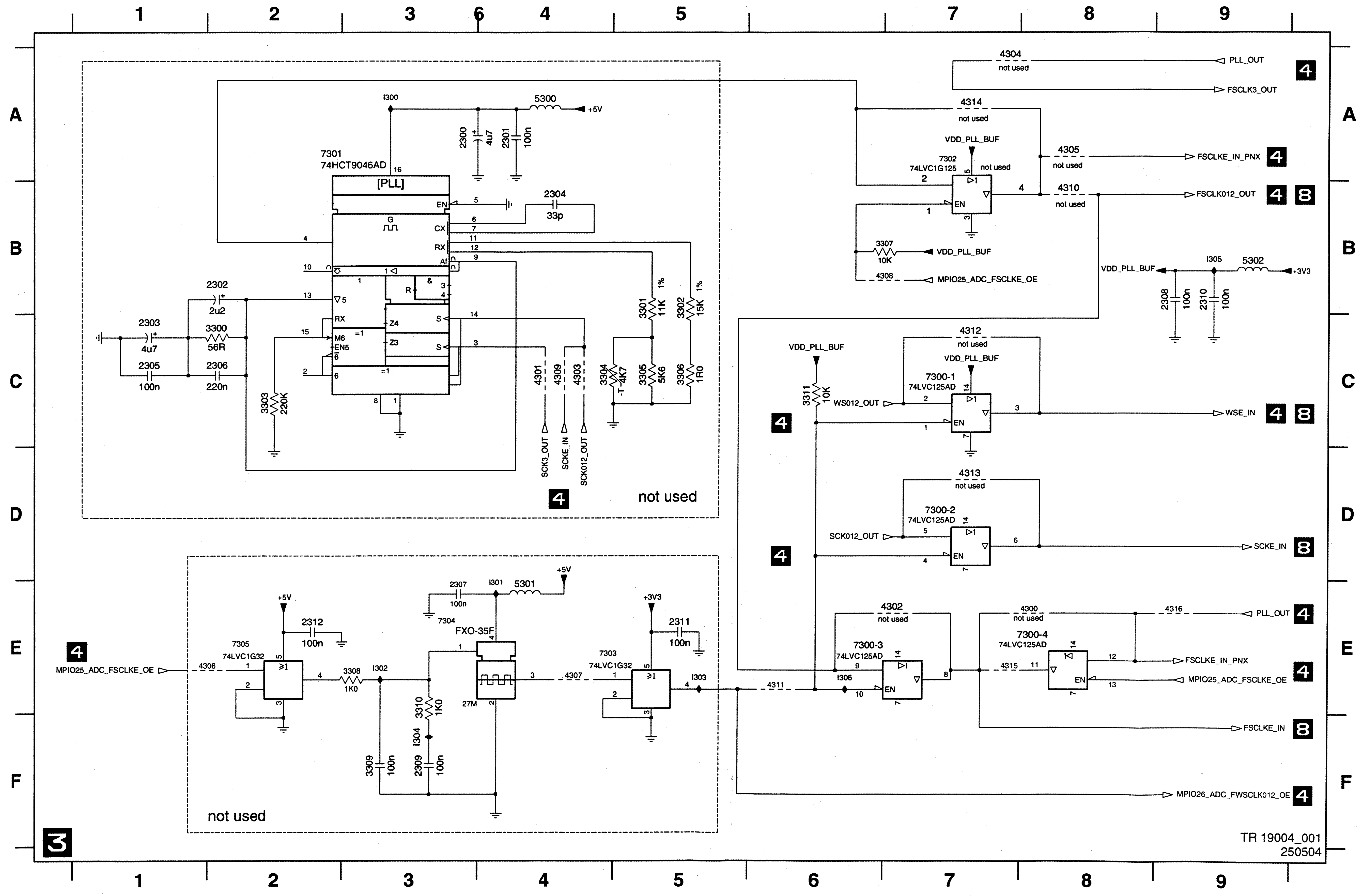
1100	A10
1102	B14
1103	H14
1104	G9
1105	B10
1106	I5
2100	A8
2101	E4
2102	D7
2103	D3
2104	D8
2105	D8
2106	D8
2107	D8
2108	A7
2109	E9
2110	E9
2111	E9
2112	H11
2113	E6
2114	E12
2116	E11
2119	I12
2120	I8
2124	I5
2125	D3
2127	A3
2128	D11
2129	A13
3080	H7
3081	H7
3082	G10
3085	C7
3086	C7
3088	I6
3090	G2
3091	H2
3092	I12
3093	I12
3094	E8
3095	C2
3096	H5
3097	I8
3098	I7
3099	I8
3100	A12
3101	A13
3102	B9
3103	A12
3104	B8
3105	B8
3106	A12
3107	B9
3108	A12
3109	B8
3110	A12
3111	B9
3112	A12
3113	B6
3114	D5
3115	B8
3116	A12
3117	I2
3118	B12
3119	A9
3120	B12
3121	F6
3122	B12
3123	F7
3124	B12
3125	G6
3126	B12
3127	G7
3128	B12
3129	G4
3130	B12
3131	C7
3132	F5
3133	C12
3134	G4
3135	C12
3136	C7
3137	G6
3138	C12
3139	C7
3140	C7
3141	C7
3142	G7
3143	C12
3144	G7
3145	C12
3146	F11
3147	E13
3149	F13
3150	I6
3152	D8
3154	D12
3156	D12
3157	D8
3159	E13
3161	D12
3162	E2
3163	D2
3164	D12
3165	D2
3167	F13
3168	D12
3170	E13
3172	F13
3173	E2
3175	E14
3176	B3
3178	F14
3180	D12
3184	F2
3185	G11
3186	H12
3187	G2
3189	H12
3191	H11
3192	H12
3195	I10
3197	I12
3199	I12
4101	A8
4110	F8
4111	H7
4113	F8
4115	D1
4116	G5
4117	E6
4118	F8
4119	F8
4121	H6
4122	B5
4123	B5
4124	D11
4125	D11
5100	C4
5102	E11
5103	I13
5104	H8
5108	A5
6100	E5
6101	E6
6103	E11
7100	F5
7101	F6
7102-1	A4
7102-2	A5
7102-3	B4
7102-4	B5
7103	A8
7104-1	H2
7104-2	I3
7104-3	D2
7104-4	E2
7105	G5
7106	E5
7107-1	F2
7107-2	F2
7107-3	G2
7107-4	H5
7108	G6
7109	E12
7111-1	G11
7111-2	I11
7111-3	H11
7111-4	I11
7111-5	I6
7111-6	I7
F0001	B9
F0003	B9
F0005	B9
F0007	B9
F0009	B9
F0011	B9
F0015	A10
F0201	A14
F0202	B14
F0203	A13
F0204	A12
F0205	A13
F0206	A12
F0207	A13
F0208	A12
F0209	B13
F0210	B12
F0211	B13
F0212	B12
F0213	B13
F0214	B12
F0215	B13
F0216	C12
F0217	C13
F0218	C12
F0221	C13
F0223	C14
F0225	C13
F0227	D14
F0229	D13
F0231	D14
F0233	D13
F0234	D13
F0235	D13
F0236	E13
F0237	E14
F0238	E14
F0239	D12
F0301	H13
F0302	H13
F0303	H13
F0304	H13
F0305	H13
F0306	H13
F0307	I13
F0401	H9
F0402	H9
F0403	H9
F0404	H9
F0405	G9
F0406	G9
F0407	G9
F0408	G9
F0409	G9
F0410	G9
F0501	C10
F0503	D9
F0506	D9
F0508	B9
F0509	C9
F0510	C9
F0511	C9
F0512	C9
F0514	C9
F0601	I5
F0603	I5
F936	G3
I100	E6
I102	E6
I103	A3
I104	A3
I105	A5
I106	B5
I108	D3
I109	E3
I110	F3
I111	G3
I112	C3
I114	C1
I115	A4
I116	E11
I117	H8
I119	E2
I120	E2
I121	F2
I122	G2
I123	I2
I124	H2

Digital Board Chrysalis 2.1: 1394


for DV_IN only
PDI1394P25
7200 PDI1394P25
PHY
BIAS VOLTAGE AND CURRENT GENERATOR
RECEIVED DATA DECODER/ TIMER
LINK INTERFACE
ARBITR'N AND CONTROL STATE MACHINE LOGIC
XTAL OSC. PLL CLOCK
TRANSMIT DATA ENCODER
AVDD
TESTM
DVDD
PLLVDD
AGND
DGND
PLLGND
LINK
7201 PDI1394L40
VDD
LINK CORE
12KB BUFFER MEMORY
ISOCH & ASYNC PACKETS
TRANSMITTER / RECEIVER AV1
TRANSMITTER / RECEIVER AV2
CONTROL AND STATUS REGISTERS
ASYNC TRANSMITTER AND RECEIVER
8-BIT INTERFACE
RESERVED
GND
TESTPIN
L_D(7:0)
L_D_CTL
MX_D(7:0)
MX_D_CTL
PCI_AD(31:0)
+3V3_IEEE_A
+3V3_IEEE_D
+3V3_IEEE_PLL
+3V3_LINK
+3V3
+5V
RESET_1394n
MPIO8_1394_CNA
MPIO21_1394_POWERDOWN
MPIO2_1394_IRQn
MPIO23_1394_LED
XIO_SEL1
PCI_CBE(1)
PCI_CBE(2)
7202 PDTC144EU
6200 TLMH3100
not used
always present
220R FOR C2
BOARD_ID
MPIO9_BOARD_ID_0
MPIO10_BOARD_ID_1
MPIO11_BOARD_ID_2
MPIO12_BOARD_ID_3
IC7200 pin 60, F203
A: DC, 1 V/Div, 20ns/Div
TR 19003_001
250504

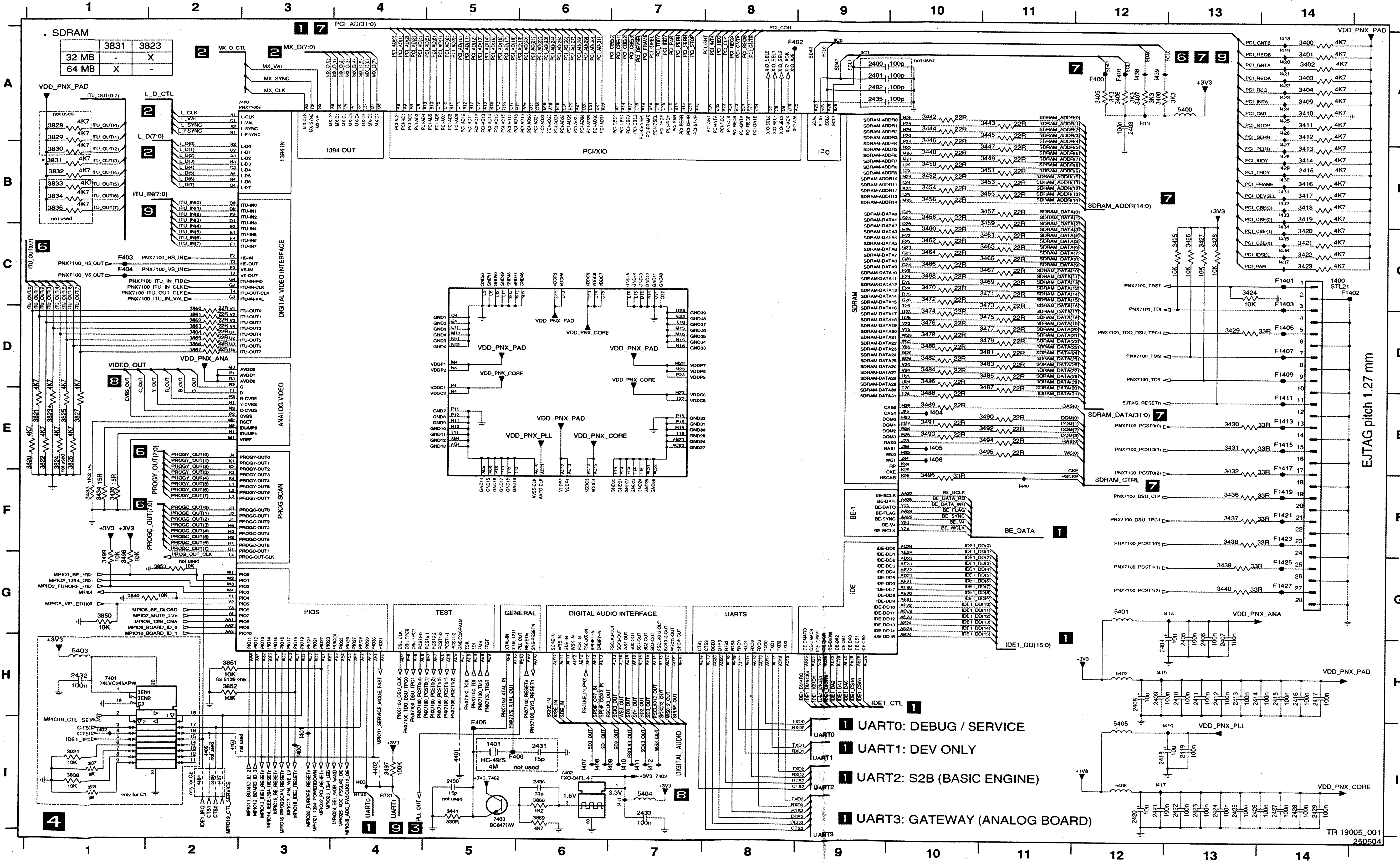
1201	D1
1203	A1
2200	B2
2201	C2
2202	D1
2203	D2
2204	D2
2205	D2
2206	G3
2207	F2
2209	G2
2210	G2
2212	H1
2214	H2
2215	H2
2217	I2
2218	I2
2219	I3
2220	I3
2221	I3
2222	I3
2223	I4
2224	I4
2225	I4
2226	I5
2227	I5
2228	I5
2229	I5
2230	I6
2231	I6
2232	I6
2233	I7
2234	I7
2235	A5
2236	G3
2237	B9
2238	B6
3200	E6
3202	F12
3203	H5
3204	D6
3205	A2
3206	B7
3207	B8
3208	B7
3209	B8
3210	C12
3211	C12
3212	B2
3213	B3
3214	C12
3215	C12
3216	B6
3217	C12
3218	C12
3219	D13
3220	B7
3221	C12
3222	C12
3223	B6
3224	C12
3225	C7
3226	C12
3227	C12
3228	C6
3229	C12
3230	D13
3231	C7
3232	C2
3233	C2
3234	C6
3235	C13
3236	C7
3237	D12
3238	C6
3239	D12
3240	C2
3241	D12
3242	C7
3243	D12
3244	D12
3245	D6
3246	E12
3247	E12
3248	D8
3249	E12
3250	E12
3251	E12
3252	E12
3253	D2
3254	E12
3255	E13
3256	E13
3257	E13
3258	E13
3259	E13
3260	F12
3261	E3
3262	F8
3263	F8
3264	F8
3265	G8
3266	G8
3267	G8
3268	G8
3269	G8
3270	G12
3271	G12
3272	G13
3273	G8
3274	F12
3275	G5
3276	G7
3277	F12
3278	F12
3279	F12
3280	A7
3281	A7
3282	A8
3283	A2
3284	A8
3285	A6
3286	H13
3287	H13
3288	H13
3289	H13
3290	I13
3291	I13
3292	I13
3293	I13
3294	F12
3295	F12
3296	F12
3297	F8
3298	F8
3299	F8
3315	F8
3316	F8
3317	F8
3318	F8
3319	F8
3320	F13
4201	D6
4202	D6
4203	G12
4204	G12
4205	A4
5200	F2
5201	F5
5202	G2
5203	H2
5204	I1
6200	G4
7200	A5
7201	B12
7202	H5
F1201	B1
F1202	A1
F1203	A1
F1204	A2
F1205	A2
F200	D12
F201	C9
F203	C3
F204	C13
F205	C13
F206	C13
F207	C13
F208	C13
F209	C13
F210	C13
F211	C13
F212	C13
F213	C13
F214	C13
F215	C13
F216	D13
F217	C13
I200	H4
I201	F2
I202	G2
I203	H2
I204	I2
I205	H11
I206	G4
I207	A3
I208	B3
I209	B3
I210	C2
I211	B7
I212	C7
I213	D6
I214	D6
I215	A6
I216	B6
I217	A8
I218	C7
I219	C7
I220	G12
I221	G12
I222	C7
I223	G12
I224	G8
I225	C7
I226	C7
I227	C7

Digital Board Chrysalis 2.1: Audio PLL

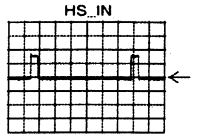

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
7301
74HCT9046AD
[PLL]
EN
CX
RX
Af
I300
5300
+5V
2300
4u7
2301
100n
2304
33p
2302
2u2
2303
4u7
3300
56R
2305
100n
2306
220n
3303
220K
3301
11K
1%
3302
15K
1%
3304
4K7
3305
5K6
3306
1R0
4301
4309
4303
SCK3_OUT
SCKE_IN
SCK012_OUT
not used
4304
not used
PLL_OUT
FSCLK3_OUT
4314
not used
VDD_PLL_BUF
7302
74LVC1G125
4305
not used
FSCLKE_IN_PNX
4310
not used
FSCLK012_OUT
3307
10K
4308
MPIO25_ADC_FSCLKE_OE
VDD_PLL_BUF
I305
5302
+3V3
2308
100n
2310
100n
4312
not used
7300-1
74LVC125AD
3311
10K
WS012_OUT
WSE_IN
4313
not used
7300-2
74LVC125AD
SCK012_OUT
SCKE_IN
4302
not used
7300-3
74LVC125AD
4300
not used
7300-4
74LVC125AD
4316
PLL_OUT
FSCLKE_IN_PNX
MPIO25_ADC_FSCLKE_OE
FSCLKE_IN
I306
4311
4315
MPIO26_ADC_FWSCLK012_OE
MPIO25_ADC_FSCLKE_OE
4306
7305
74LVC1G32
2312
100n
3308
1K0
I302
2307
100n
I301
5301
7304
FXO-35F
27M
4307
3310
1K0
I304
3309
100n
2309
100n
7303
74LVC1G32
2311
100n
I303
not used
4
8
3
TR 19004_001
250504

2300	A3
2301	A4
2302	B2
2303	C1
2304	B4
2305	C1
2306	C2
2307	E3
2308	F7
2309	F3
2310	F7
2311	E5
2312	E2
3300	C2
3301	B5
3302	B5
3303	C2
3304	C4
3305	C5
3306	C5
3307	B6
3308	E3
3309	F3
3310	E3
3311	C6
4300	E8
4301	C4
4302	E7
4303	C4
4304	A7
4305	A8
4306	E1
4307	E4
4308	B6
4309	C4
4310	B8
4311	E6
4312	C7
4313	D7
4314	A7
4315	E7
4316	E8
5300	A4
5301	E4
5302	F7
7300-1	C7
7300-2	D7
7300-3	E6
7300-4	E8
7301	A2
7302	A7
7303	E5
7304	E3
7305	E2
I300	A3
I301	E4
I302	E3
I303	E5
I304	F3
I305	F7
I306	E6

Digital Board Chrysalis 2.1: Chrysalis

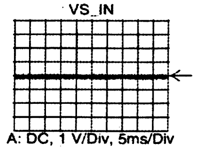

SDRAM
3831 3823
32 MB - X
64 MB X -
VDD_PNX_PAD
ITU_OUT(0:7)
L_D_CTL
L_D(7:0)
ITU_IN(7:0)
MX_D_CTL
MX_D(7:0)
PCI_AD(31:0)
PCI_CON
1394 OUT
PCI/XIO
I²C
1394 IN
DIGITAL VIDEO INTERFACE
ANALOG VIDEO
PROG SCAN
VIDEO_OUT
PROGY_OUT(7:0)
PROGC_OUT(7:0)
PIOS
TEST
GENERAL
DIGITAL AUDIO INTERFACE
UARTS
IDE
BE-1
SDRAM
SDRAM_ADDR(14:0)
SDRAM_DATA(31:0)
SDRAM_CTRL
BE_DATA
IDE1_DD(15:0)
IDE1_CTL
VDD_PNX_PAD
VDD_PNX_CORE
VDD_PNX_ANA
VDD_PNX_PLL
7400 PNX7100E
7401 74LVC245APW
7402 FXO-34FL
7403 BC847BW
1401 HC-49/S 4M
1400 STL21
EJTAG pitch 1.27 mm
DIGITAL_AUDIO
UART0: DEBUG / SERVICE
UART1: DEV ONLY
UART2: S2B (BASIC ENGINE)
UART3: GATEWAY (ANALOG BOARD)
TR 19005_001
250504
+3V3
+1V8
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I

HS_IN



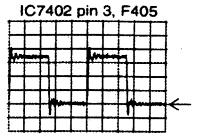
A: DC, 2 V/Div, 10us/Div

VS_IN



A: DC, 1 V/Div, 5ms/Div

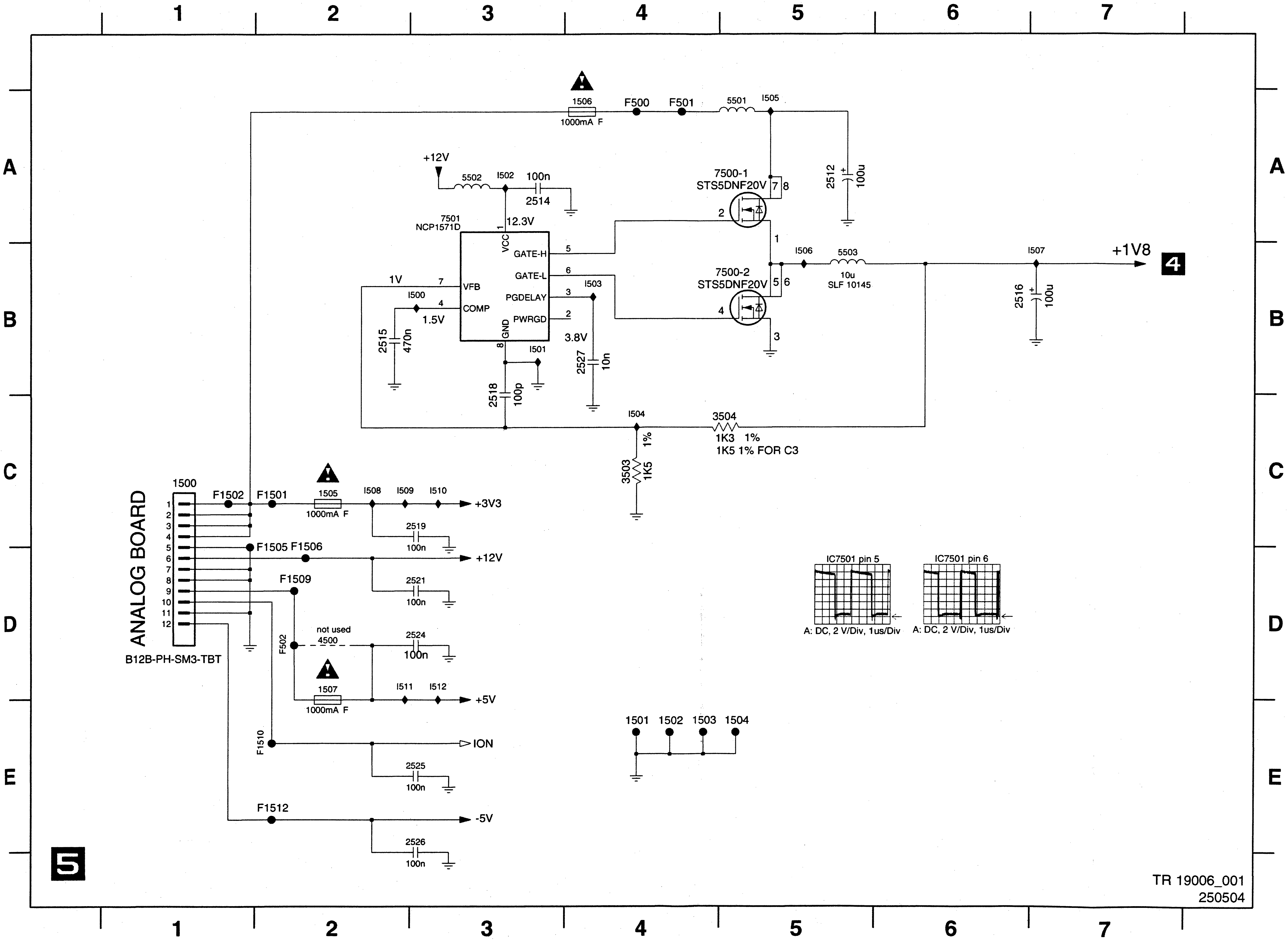
IC7402 pin 3, F405



A: DC, 1 V/Div, 50ns/Div

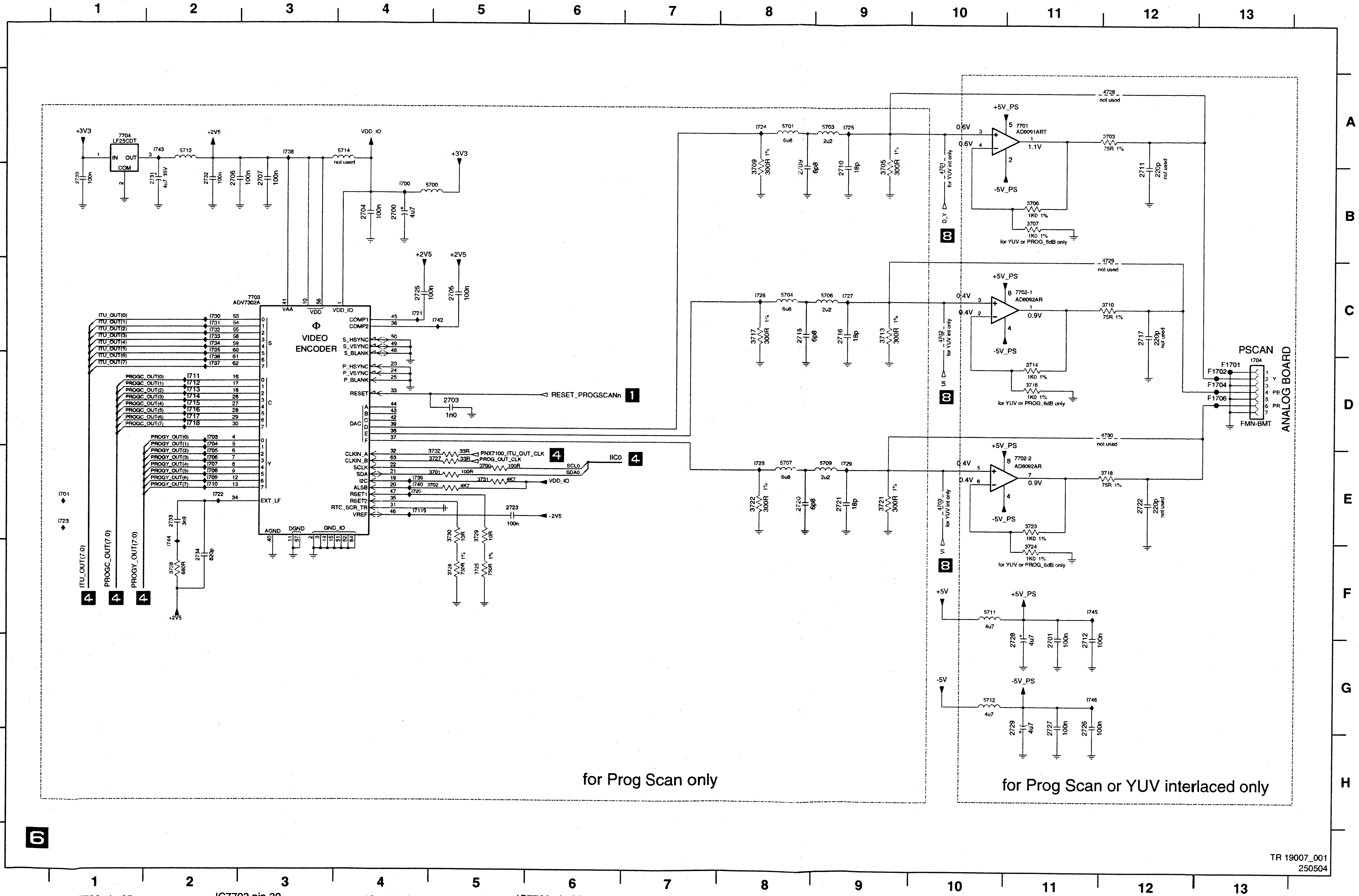
1400	C14
1401	I5
2400	A9
2401	A9
2402	A9
2403	A12
2404	H12
2405	H13
2406	H13
2407	H13
2408	H12
2409	H12
2410	H13
2411	H13
2412	H13
2413	H13
2414	H14
2415	H14
2416	H14
2417	H14
2418	I12
2419	I13
2420	I12
2421	I12
2422	I13
2423	I13
2424	I13
2425	I13
2426	I14
2427	I14
2428	I14
2429	I14
2430	I5
2431	I6
2432	H1
2433	I7
2435	A9
2436	I6
3021	I1
3400	A14
3401	A14
3402	A14
3403	A14
3404	A14
3405	A12
3406	A12
3407	A12
3408	A12
3409	A14
3410	A14
3411	A14
3412	A14
3413	B14
3414	B14
3415	B14
3416	B14
3417	B14
3418	B14
3419	B14
3420	C14
3421	C14
3422	C14
3423	C14
3424	C13
3425	C13
3426	C13
3427	C13
3428	C13
3429	D13
3430	E13
3431	E13
3432	E13
3433	F1
3434	F1
3435	F1
3436	F13
3437	F13
3438	F13
3439	G13
3440	G13
3441	I5
3442	A10
3443	A11
3444	A10
3445	A11
3446	A10
3447	B11
3448	B10
3449	B11
3450	B10
3451	B11
3452	B10
3453	B11
3454	B10
3455	B11
3456	B10
3457	B11
3458	B10
3459	B11
3460	C10
3461	C11
3462	C10
3463	C11
3464	C10
3465	C11
3466	C10
3467	C11
3468	C10
3469	C11
3470	C10
3471	C11
3472	C10
3473	C11
3474	D10
3475	D11
3476	D10
3477	D11
3478	D10
3479	D11
3480	D10
3481	D11
3482	D10
3483	D11
3484	D10
3485	D11
3486	D10
3487	D11
3488	E10
3489	E10
3490	E11
3491	E10
3492	E11
3493	E10
3494	E11
3495	E11
3496	F10
3497	I4
3498	G1
3499	G1
3820	E1
3821	E1
3822	E1
3823	E1
3824	E1
3825	E1
3826	E1
3827	E1
3828	A1
3829	A1
3830	B1
3831	B1
3832	B1
3833	B1
3834	B1
3835	B1
3837	I1
3838	I1
3839	I1
3840	G1
3850	G1
3851	H2
3852	H2
3853	G2
3860	D2
3861	D2
3862	D2
3863	D2
3864	D2
3865	D2
3866	D2
3867	D2
3868	I6
3869	I6
4401	I5
4402	I4
4403	I2
4404	I2
4405	I2
4406	I2
4407	I2
5400	A13
5401	G12
5402	H12
5403	H1
5404	I7
5405	I12
5406	I12
7400	A2
7401	H1
7402	I6
7403	I5
F1401	C14
F1402	C14
F1403	C14
F1405	D14
F1407	D14
F1409	D14
F1411	E14
F1413	E14
F1415	E14
F1417	E14
F1419	F14
F1421	F14
F1423	F14
F1425	G14
F1427	G14
F400	A12
F401	A12
F402	A8
F403	C1
F404	C1
F405	I5
F406	I6
I400	I3
I401	I3
I402	I1
I403	I4
I404	E10
I405	E10
I406	E10
I407	I6
I408	I6
I409	I7
I410	I7
I411	I7
I412	I7
I413	A12
I414	G13
I415	H12
I416	I13
I417	I12
I418	A14
I419	A14
I420	A14
I421	A14
I422	A14
I423	A14
I424	A14
I425	A14
I426	A14
I427	A14
I428	B14
I429	B14
I430	B14
I431	B14
I432	B14
I433	B14
I434	B14
I435	C14
I436	C14
I437	C14
I438	A12
I439	A12
I440	F11
I441	I7

Digital Board Chrysalis 2.1: 1.8V Power

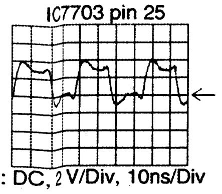

1
2
3
4
5
6
7
A
B
C
D
E
1506
1000mA F
F500
F501
5501
I505
+12V
5502
I502
100n
2514
7500-1
STS5DNF20V
2512
100u
7501
NCP1571D
12.3V
VCC
GATE-H
GATE-L
PGDELAY
PWRGD
GND
VFB
COMP
1V
I500
1.5V
2515
470n
I503
3.8V
2527
10n
I501
2518
100p
7500-2
STS5DNF20V
I506
5503
10u
SLF 10145
I507
+1V8
2516
100u
I504
3504
1K3 1%
1K5 1% FOR C3
3503
1K5
1%
1500
ANALOG BOARD
B12B-PH-SM3-TBT
F1502
F1501
1505
1000mA F
I508
I509
I510
+3V3
2519
100n
F1505 F1506
+12V
2521
100n
F1509
F502
not used
4500
2524
100n
1507
1000mA F
I511
I512
+5V
F1510
ION
2525
100n
F1512
-5V
2526
100n
IC7501 pin 5
A: DC, 2 V/Div, 1us/Div
IC7501 pin 6
A: DC, 2 V/Div, 1us/Div
1501
1502
1503
1504
4
5
TR 19006_001
250504

1500	C1
1501	E4
1502	E4
1503	E4
1504	E5
1505	C2
1506	A4
1507	D2
2512	A5
2514	A3
2515	B2
2516	B6
2518	C3
2519	C3
2521	D3
2524	D3
2525	E3
2526	E3
2527	B4
3503	C4
3504	C5
4500	D2
5501	A5
5502	A3
5503	B5
7500-1	A5
7500-2	B5
7501	A3
F1501	C2
F1502	C1
F1505	D2
F1506	D2
F1509	D2
F1510	D2
F1512	E2
F500	A4
F501	A4
F502	D2
I500	B3
I501	B3
I502	A3
I503	B4
I504	C4
I505	A5
I506	B5
I507	B6
I508	C2
I509	C2
I510	C3
I511	D2
I512	D3

Digital Board Chrysalis 2.1: Prog. scan DAC

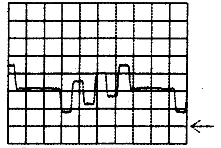

1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H
+3V3
7704
LF25CDT
IN OUT
COM
2730 100n
2731 4u7 35V
I743
5713
+2V5
2732 100n
2706 100n
2707 100n
I738
5714 not used
VDD_IO
+3V3
I700
5700
2704 100n
2700 4u7
+2V5
+2V5
2725 100n
2705 100n
7703
ADV7302A
VAA
VDD
VDD_IO
Φ
VIDEO ENCODER
ITU_OUT(0)
ITU_OUT(1)
ITU_OUT(2)
ITU_OUT(3)
ITU_OUT(4)
ITU_OUT(5)
ITU_OUT(6)
ITU_OUT(7)
PROGC_OUT(0)
PROGC_OUT(1)
PROGC_OUT(2)
PROGC_OUT(3)
PROGC_OUT(4)
PROGC_OUT(5)
PROGC_OUT(6)
PROGC_OUT(7)
PROGY_OUT(0)
PROGY_OUT(1)
PROGY_OUT(2)
PROGY_OUT(3)
PROGY_OUT(4)
PROGY_OUT(5)
PROGY_OUT(6)
PROGY_OUT(7)
S
C
Y
EXT_LF
COMP1
COMP2
S_HSYNC
S_VSYNC
S_BLANK
P_HSYNC
P_VSYNC
P_BLANK
RESET
DAC
CLKIN_A
CLKIN_B
SCLK
SDA
I2C
ALSB
RSET1
RSET2
RTC_SCR_TR
VREF
AGND
DGND
GND_IO
2703 1n0
RESET_PROGSCANn 1
3732 33R
3727 33R
PNX7100_ITU_OUT_CLK 4
PROG_OUT_CLK
3700 100R
3701 100R
SCL0
SDA0
IIC0 4
3731 4K7
3702 4K7
VDD_IO
2723 100n
-2V5
3730 10R
3729 10R
3726 750R 1%
3725 750R 1%
I701
I723
2733 3n9
I744
2734 820p
3728 680R
+2V5
ITU_OUT(7:0) 4
PROGC_OUT(7:0) 4
PROGY_OUT(7:0) 4
I724 5701 6u8 5703 2u2 I725
3709 300R 1%
2709 6p8
2710 18p
3705 300R 1%
4701 for YUV int only
D_Y 8
I726 5704 6u8 5706 2u2 I727
3717 300R 1%
2715 6p8
2716 18p
3713 300R 1%
4702 for YUV int only
U 8
I728 5707 6u8 5709 2u2 I729
3722 300R 1%
2720 6p8
2721 18p
3721 300R 1%
4703 for YUV int only
V 8
+5V_PS
-5V_PS
7701 AD8091ART
0.6V
0.6V
1.1V
3703 75R 1%
2711 220p not used
3706 1K0 1%
3707 1K0 1%
for YUV or PROG_6dB only
4728 not used
7702-1 AD8092AR
0.4V
0.4V
0.9V
3710 75R 1%
2717 220p not used
3714 1K0 1%
3716 1K0 1%
for YUV or PROG_6dB only
4729 not used
7702-2 AD8092AR
0.4V
0.4V
0.9V
3718 75R 1%
2722 220p not used
3723 1K0 1%
3724 1K0 1%
for YUV or PROG_6dB only
4730 not used
PSCAN
F1701
1704
F1702
F1704
F1706
Y
PB
PR
FMN-BMT
ANALOG BOARD
+5V
5711 4u7
I745
2728 4u7
2701 100n
2712 100n
-5V
5712 4u7
I746
2729 4u7
2727 100n
2726 100n
for Prog Scan only
for Prog Scan or YUV interlaced only
6
TR 19007_001
250504

IC7703 pin 25



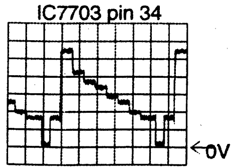
A: DC, 2V/Div, 10ns/Div

IC7703 pin 32



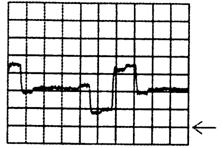
A: DC, 200mV/Div, 5us/Div

IC7703 pin 34



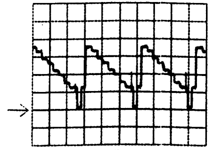
A: DC, 200mV/Div, 5us/Div

IC7703 pin 36



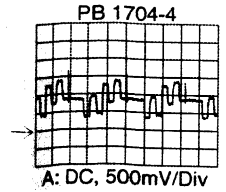
A: DC, 200mV/Div, 5us/Div

Y 1704-2



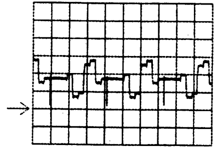
A: DC, 500mV/Div
10us/Div

PB 1704-4



A: DC, 500mV/Div
10us/Div

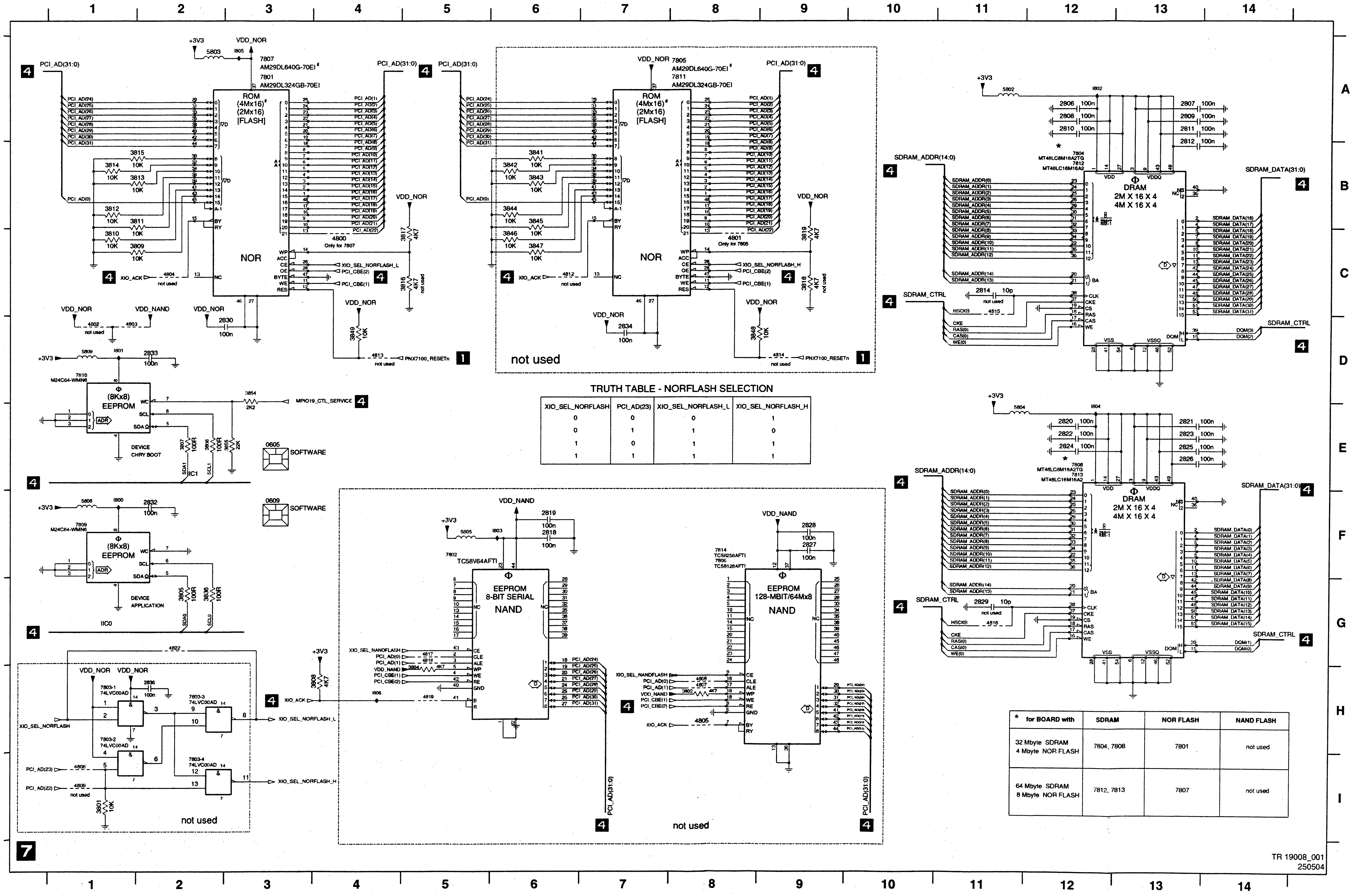
PR 1704-6



A: DC, 500mV/Div
10us/Div

1704	D13
2700	B4
2701	G11
2703	D5
2704	B4
2705	C5
2706	B2
2707	B3
2709	B8
2710	B9
2711	B12
2712	G11
2715	C8
2716	C9
2717	C12
2720	E8
2721	E9
2722	E12
2723	E5
2725	C4
2726	G11
2727	G11
2728	G11
2729	G11
2730	B1
2731	B2
2732	B2
2733	E2
2734	F2
3700	E5
3701	E5
3702	E5
3703	A12
3705	B9
3706	B11
3707	B11
3709	B8
3710	C12
3713	C9
3714	D11
3716	D11
3717	C8
3718	E12
3721	E9
3722	E8
3723	E11
3724	F11
3725	F5
3726	F5
3727	E5
3728	F2
3729	E5
3730	E5
3731	E5
3732	E5
4701	B10
4702	C10
4703	E10
4728	A12
4729	C12
4730	D12
5700	B4
5701	A8
5703	A9
5704	C8
5706	C9
5707	E8
5709	E9
5711	F10
5712	G10
5713	A2
5714	A4
7701	A11
7702-1	C11
7702-2	E11
7703	C3
7704	A1
F1701	D13
F1702	D13
F1704	D13
F1706	D13
I700	B4
I701	E1
I703	D2
I704	D2
I705	E2
I706	E2
I707	E2
I708	E2
I709	E2
I710	E2
I711	D2
I7119	E4
I712	D2
I713	D2
I714	D2
I715	D2
I716	D2
I717	D2
I718	D2
I720	E4
I721	C4
I722	E2
I723	E1
I724	A8
I725	A9
I726	C8
I727	C9
I728	E8
I729	E9
I730	C2
I731	C2
I732	C2
I733	C2
I734	C2
I735	C2
I736	D2
I737	D2
I738	A3
I739	E4
I740	E4
I742	C5
I743	A2
I744	F2
I745	F11
I746	G11

Digital Board Chrysalis 2.1: Flash SDRAM EEPROM


ROM (4Mx16)# (2Mx16) [FLASH]
NOR
7807 AM29DL640G-70EI#
7801 AM29DL324GB-70EI
7805 AM29DL640G-70EI#
7811 AM29DL324GB-70EI
PCI_AD(31:0)
VDD_NOR
VDD_NAND
+3V3
XIO_SEL_NORFLASH_L
XIO_SEL_NORFLASH_H
PCI_CBE(2)
PCI_CBE(1)
XIO_ACK
PNX7100_RESETn
Only for 7807
Only for 7805
not used
7810 M24C64-WMN6
(8Kx8) EEPROM
DEVICE CHRY BOOT
7809 M24C64-WMN6
DEVICE APPLICATION
MPIO19_CTL_SERVICE
0605 SOFTWARE
0609 SOFTWARE
IIC1
IIC0
XIO_SEL_NORFLASH
7803-1 74LVC00AD
7803-2 74LVC00AD
7803-3 74LVC00AD
7803-4 74LVC00AD
PCI_AD(23)
PCI_AD(22)
7802 TC58V64AFTI
EEPROM 8-BIT SERIAL NAND
7814 TC58256AFTI
7806 TC58128AFTI
EEPROM 128-MBIT/64Mx8 NAND
XIO_SEL_NANDFLASH
7804 MT48LC8M16A2TG
7812 MT48LC16M16A2
7808 MT48LC8M16A2TG
7813 MT48LC16M16A2
DRAM 2M X 16 X 4 4M X 16 X 4
SDRAM_ADDR(14:0)
SDRAM_DATA(31:0)
SDRAM_CTRL
CKE
RAS(0)
CAS(0)
WE(0)
HSCKB
DQM(3)
DQM(2)
DQM(1)
DQM(0)
VDD VDDQ VSS VSSQ
TR 19008_001
250504

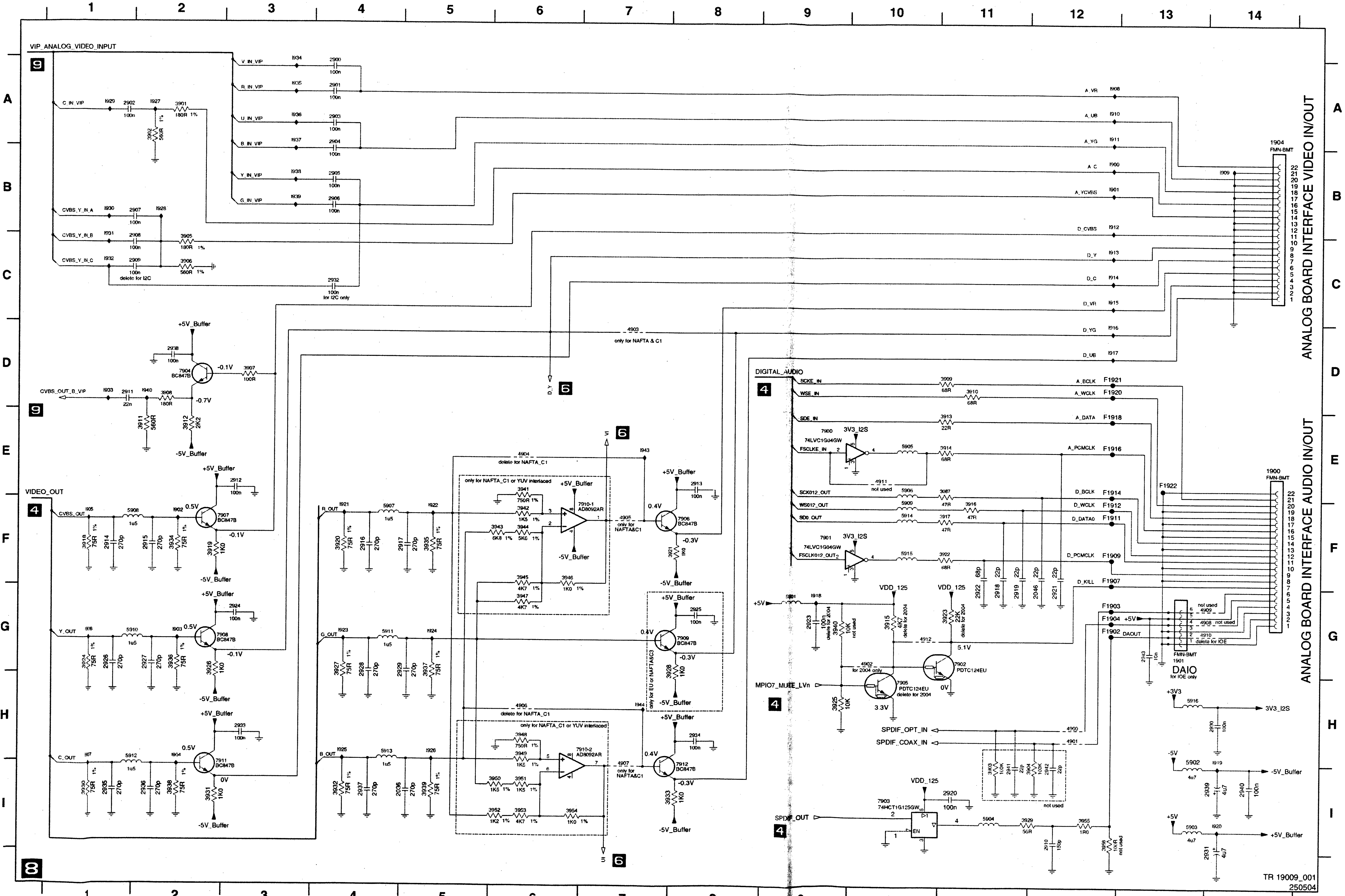
TRUTH TABLE - NORFLASH SELECTION

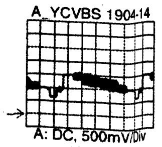
XIO_SEL_NORFLASH	PCI_AD(23)	XIO_SEL_NORFLASH_L	XIO_SEL_NORFLASH_H
0	0	0	1
0	1	1	0
1	0	1	1
1	1	1	1

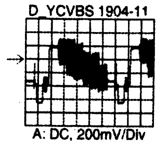
* for BOARD with	SDRAM	NOR FLASH	NAND FLASH
32 Mbyte SDRAM 4 Mbyte NOR FLASH	7804, 7808	7801	not used
64 Mbyte SDRAM 8 Mbyte NOR FLASH	7812, 7813	7807	not used

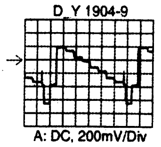
0605	E3
0609	F3
2806	A12
2807	A13
2808	A12
2809	A13
2810	A12
2811	A13
2812	B13
2814	C11
2818	F6
2819	F6
2820	E12
2821	E13
2822	E12
2823	E13
2824	E12
2825	E13
2826	E13
2827	F9
2828	F9
2829	G11
2830	D3
2832	F2
2833	D2
2834	D7
2836	H2
3801	I1
3802	H8
3804	H5
3805	G2
3806	E2
3807	E2
3808	H4
3809	C2
3810	C1
3811	B2
3812	B1
3813	B2
3814	B1
3815	B2
3816	C5
3817	C5
3818	C9
3819	C9
3836	G2
3841	B6
3842	B6
3843	B6
3844	B6
3845	B6
3846	C6
3847	C6
3848	D8
3849	D4
3854	D3
3855	E3
4800	C4
4801	C8
4802	D1
4803	D1
4804	C2
4805	H8
4806	H8
4807	H8
4808	I1
4809	I1
4812	C6
4813	D4
4814	D9
4815	C11
4816	G11
4817	G5
4818	G5
4819	H5
4822	G2
5802	A11
5803	A2
5804	E11
5805	F5
5808	F1
5809	D1
7801	A3
7802	F5
7803-1	H1
7803-2	H1
7803-3	H2
7803-4	I2
7804	B12
7805	A8
7806	F8
7807	A3
7808	E12
7809	F1
7810	D1
7811	A8
7812	B12
7813	E12
7814	F8
I800	F1
I801	D1
I802	A12
I803	F6
I804	E12
I805	A3
I806	H4

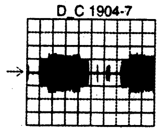
Digital Board Chrysalis 2.1: Video IO

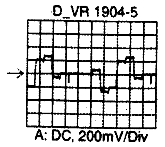

VIP_ANALOG_VIDEO_INPUT
V_IN_VIP
R_IN_VIP
U_IN_VIP
B_IN_VIP
Y_IN_VIP
G_IN_VIP
C_IN_VIP
CVBS_Y_IN_A
CVBS_Y_IN_B
CVBS_Y_IN_C
delete for I2C
100n for I2C only
+5V_Buffer
-5V_Buffer
BC847B
CVBS_OUT_B_VIP
VIDEO_OUT
CVBS_OUT
Y_OUT
C_OUT
R_OUT
G_OUT
B_OUT
only for NAFTA & C1
delete for NAFTA_C1
only for NAFTA_C1 or YUV interlaced
AD8092AR
only for EU or NAFTA&C1
D_Y
A_VR
A_UB
A_YG
A_C
A_YCVBS
D_CVBS
D_Y
D_C
D_VR
D_YG
D_UB
FMN-BMT
ANALOG BOARD INTERFACE VIDEO IN/OUT
DIGITAL_AUDIO
SCKE_IN
WSE_IN
SDE_IN
FSCLKE_IN
SCK012_OUT
WS012_OUT
SD0_OUT
FSCLK012_OUT2
74LVC1G04GW
3V3_I2S
A_BCLK
A_WCLK
A_DATA
A_PCMCLK
D_BCLK
D_WCLK
D_DATA0
D_PCMCLK
D_KILL
DAOUT
not used
PDTC124EU
delete for 2004
for 2004 only
MPIO7_MUTE_LVn
VDD_125
SPDIF_OPT_IN
SPDIF_COAX_IN
SPDIF_OUT
74HCT1G125GW
DAIO
for IOE only
ANALOG BOARD INTERFACE AUDIO IN/OUT
+3V3
-5V
+5V
TR 19009_001
250504

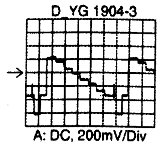

A_YCVBS 1904-14
A: DC, 500mV/Div
10us/Div

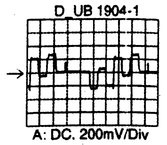

D_YCVBS 1904-11
A: DC, 200mV/Div
10us/Div


D_Y 1904-9
A: DC, 200mV/Div
10us/Div


D_C 1904-7
A: DC, 200mV/Div
10us/Div

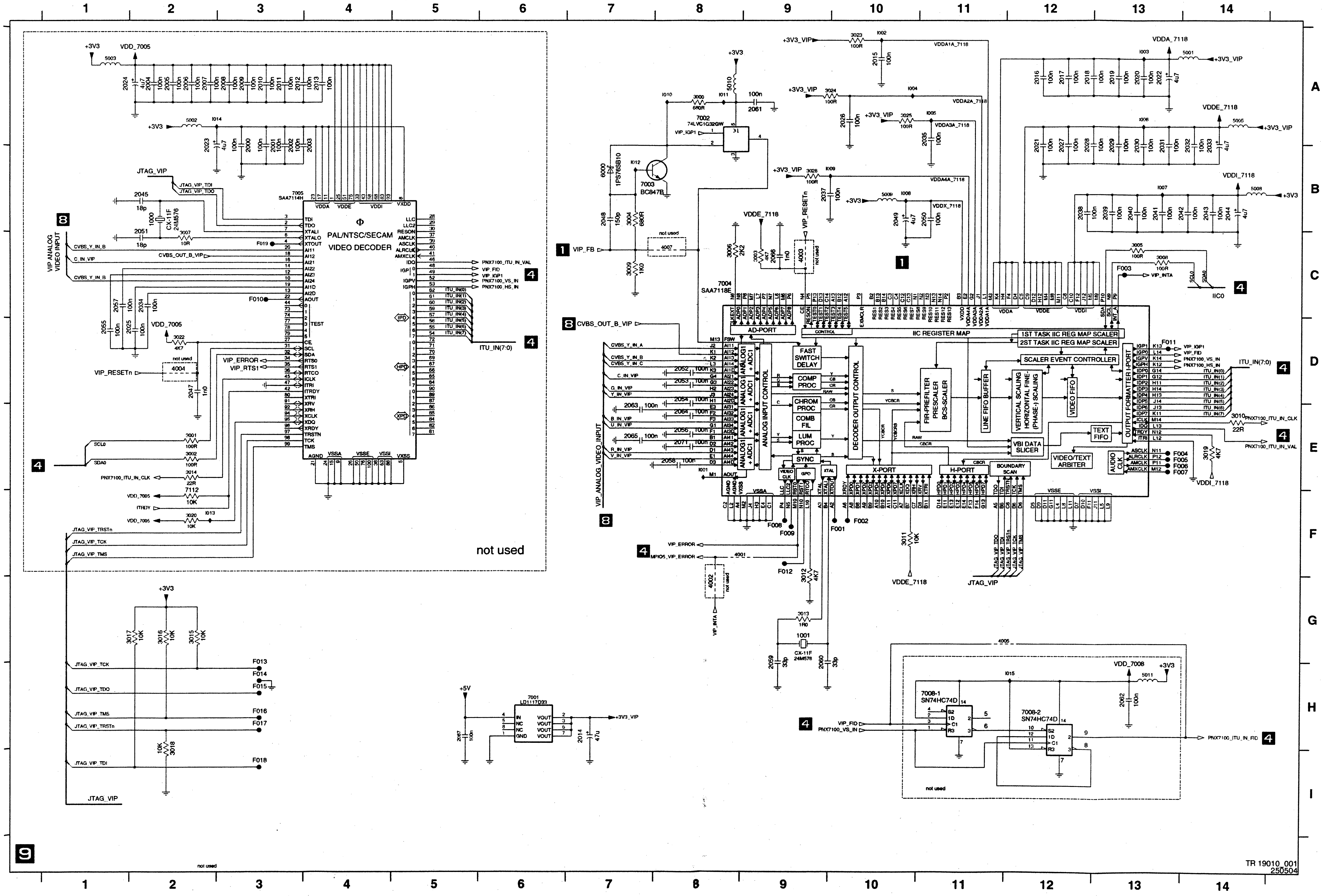

D_VR 1904-5
A: DC, 200mV/Div
10us/Div


D_YG 1904-3
A: DC, 200mV/Div
10us/Div


D_UB 1904-1
A: DC. 200mV/Div
10us/Div

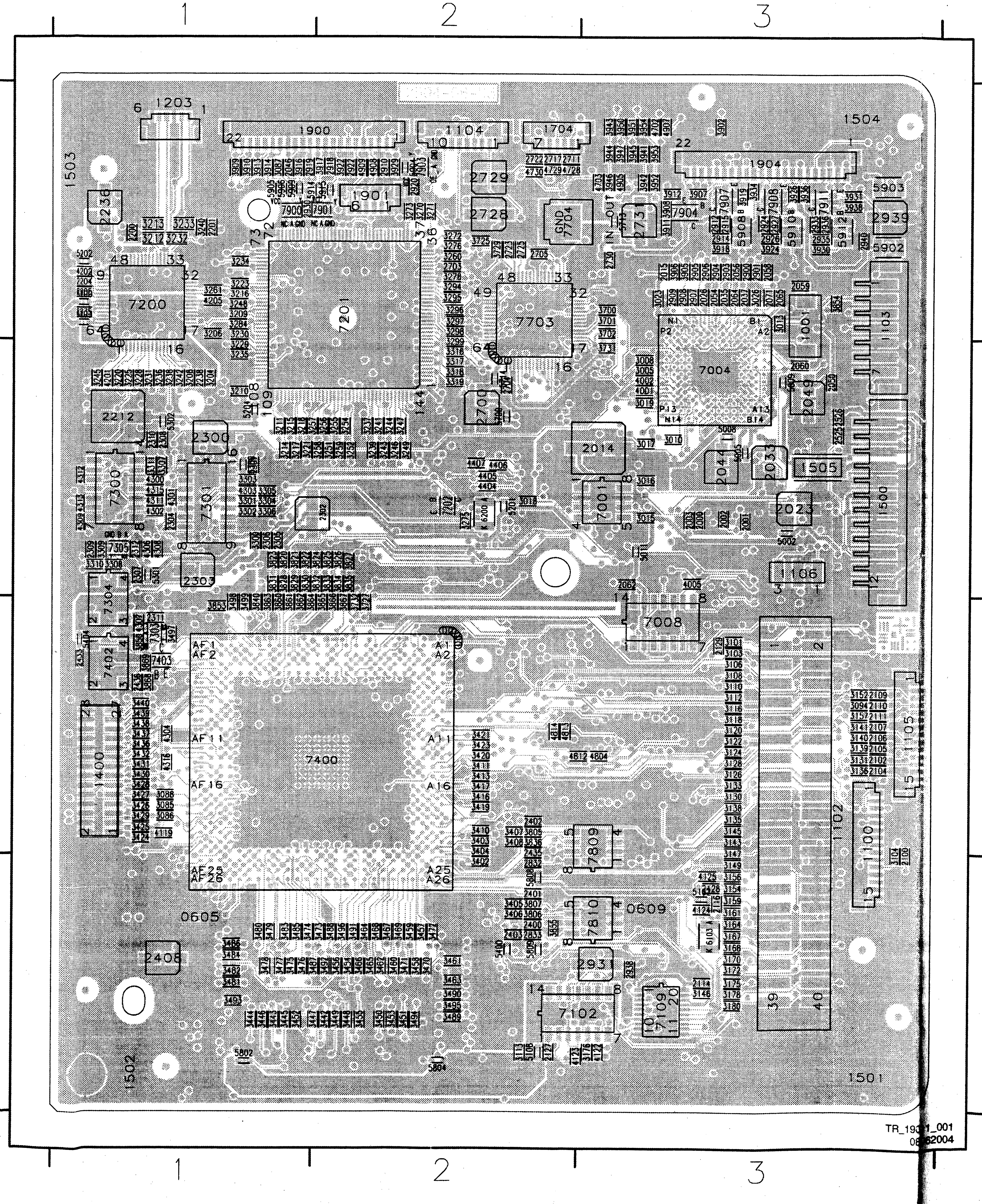
1900	E14
1901	G13
1904	A14
2036	I5
2046	G12
2900	A4
2901	A4
2902	A1
2903	A4
2904	A4
2905	B4
2906	B4
2907	B1
2908	C1
2909	C1
2910	I12
2911	D1
2912	E3
2913	E8
2914	F1
2915	F2
2916	F4
2917	F5
2918	G11
2919	G11
2920	I11
2921	G12
2922	G11
2923	G9
2924	G3
2925	G8
2926	G1
2927	G2
2928	G4
2929	G5
2930	H14
2931	I14
2932	C4
2933	H3
2934	H8
2935	I1
2936	I2
2937	I4
2938	D2
2939	I14
2940	I14
2941	I11
2942	I12
2943	G13
3087	E11
3901	A2
3902	A2
3903	I11
3904	I12
3905	C2
3906	C2
3907	D3
3908	D2
3909	D11
3910	D11
3911	E2
3912	E2
3913	E11
3914	E11
3915	G10
3916	F11
3917	F11
3918	F1
3919	F2
3920	F4
3921	F8
3922	F11
3923	G11
3924	G1
3925	H9
3926	G2
3927	G4
3928	G8
3929	I11
3930	I1
3931	I2
3932	I4
3933	I8
3934	F2
3935	F5
3936	G2
3937	G5
3938	I2
3939	I5
3940	G9
3941	E6
3942	F6
3943	F6
3944	F6
3945	F6
3946	F6
3947	G6
3948	H6
3949	H6
3950	I6
3951	I6
3952	I6
3953	I6
3954	I6
3955	I12
3956	I12
4900	H12
4901	H12
4902	G10
4903	D7
4904	E6
4905	F7
4906	H6
4907	I7
4908	G13
4909	G13
4910	G13
4911	E10
4912	G10
5901	G9
5902	H13
5903	I13
5904	I11
5905	E10
5906	E10
5907	F4
5908	F1
5909	F10
5910	G1
5911	G4
5912	H1
5913	H4
5914	F10
5915	F10
5916	H13
7900	E9
7901	F9
7902	G11
7903	I10
7904	D2
7905	H10
7906	F8
7907	F2
7908	G2
7909	G8
7910-1	F6
7910-2	H6
7911	I2
7912	I8
F1902	G12
F1903	G12
F1904	G12
F1907	F12
F1909	F12
F1911	F12
F1912	F12
F1914	E12
F1916	E12
F1918	E12
F1920	D12
F1921	D12
F1922	E13
I900	B12
I901	B12
I902	F2
I903	G2
I904	H2
I905	F1
I906	G1
I907	H1
I908	A12
I909	B14
I910	A12
I911	A12
I912	B12
I913	C12
I914	C12
I915	C12
I916	D12
I917	D12
I918	G9
I919	H14
I920	I14
I921	F4
I922	F5
I923	G4
I924	G5
I925	H4
I926	H5
I927	A2
I928	B2
I929	A1
I930	B1
I931	C1
I932	C1
I933	D1
I934	A3
I935	A3
I936	A3
I937	A3
I938	B3
I939	B3
I940	D2
I943	E7
I944	H7

Digital Board Chrysalis 2.1: VIPs


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
7005
SAA7114H
PAL/NTSC/SECAM
VIDEO DECODER
not used
JTAG_VIP
VIP ANALOG VIDEO INPUT
CVBS_OUT_B_VIP
VIP_RESETn
VIP_ERROR
VIP_RTS1
+3V3
+5V
VDD_7005
7001
LD1117D33
+3V3_VIP
7002
74LVC1G32GW
7003
BC847B
6000
1PS76SB10
VIP_FB
7004
SAA7118E
AD-PORT
IIC REGISTER MAP
1ST TASK IIC REG MAP SCALER
2ST TASK IIC REG MAP SCALER
SCALER EVENT CONTROLLER
FAST SWITCH DELAY
COMP PROC
CHROM PROC
COMB FIL
LUM PROC
SYNC
ANALOG INPUT CONTROL
DECODER OUTPUT CONTROL
FIR-PREFILTER PRESCALER BCS-SCALER
LINE FIFO BUFFER
VERTICAL SCALING HORIZONTAL FINE-(PHASE-) SCALING
VIDEO FIFO
OUTPUT FORMATTER I-PORT
TEXT FIFO
VBI DATA SLICER
VIDEO/TEXT ARBITER
AUDIO CLK
X-PORT
H-PORT
BOUNDARY SCAN
VIP_ANALOG_VIDEO_INPUT
ITU_IN(7:0)
PNX7100_ITU_IN_CLK
PNX7100_ITU_IN_VAL
VIP_INTA
IIC0
VDDA_7118
VDDE_7118
VDDI_7118
VDDX_7118
1001
CX-11F
24M576
7008-1
SN74HC74D
7008-2
SN74HC74D
VIP_FID
PNX7100_VS_IN
PNX7100_ITU_IN_FID
VDD_7008
4005
not used
TR 19010_001
250504

1000	B2
1001	G9
2000	B3
2001	B3
2002	B3
2003	B4
2004	A2
2005	A2
2006	A2
2007	A2
2008	A3
2009	A3
2010	A3
2011	A3
2012	A3
2013	A4
2014	H7
2015	A10
2016	A12
2017	A12
2018	A12
2019	A13
2020	A13
2021	B12
2022	A13
2023	B2
2024	A1
2025	D2
2026	A10
2027	B12
2028	B12
2029	B13
2030	B13
2031	B13
2032	B14
2033	B14
2034	C2
2035	A11
2037	B9
2038	B12
2039	B13
2040	B13
2041	B13
2042	B14
2043	B14
2044	B14
2045	B2
2047	D2
2048	B7
2049	B10
2050	B11
2051	C2
2052	D8
2053	D8
2054	D8
2055	D1
2056	E8
2057	C1
2058	E8
2059	H9
2060	H9
2061	A9
2062	H13
2063	D7
2064	E8
2065	E7
2066	C9
2067	H5
2071	E8
3000	A8
3001	E2
3002	E2
3003	C9
3004	B7
3005	C13
3006	C8
3007	C2
3008	C13
3009	C7
3010	E14
3011	F10
3012	G9
3013	G9
3014	E2
3015	G2
3016	G2
3017	G2
3018	I2
3019	E14
3020	F2
3022	D2
3023	A10
3024	A9
3025	A10
3026	B9
4001	F8
4002	G8
4003	C9
4004	D2
4005	G11
4007	C8
5001	A14
5002	A2
5003	A1
5005	A14
5008	B14
5009	B10
5010	A8
5011	H13
6000	B7
7001	H6
7002	A8
7003	B7
7004	C8
7005	B3
7008-1	H11
7008-2	H12
7112	F2
F001	F10
F002	F10
F003	C13
F004	E13
F005	E13
F006	E13
F007	E13
F008	F9
F009	F9
F010	C3
F011	D13
F012	F9
F013	H3
F014	H3
F015	H3
F016	H3
F017	H3
F018	I3
F019	C3
I001	E8
I002	A10
I003	A13
I004	A10
I005	A11
I006	A13
I007	B13
I008	B10
I009	B9
I010	A8
I011	A8
I012	B7
I013	F2
I014	A2
I015	H12

Layout Digital Board Chrysalis 2.1 (Top View)



0605	D1
0609	D3
1001	A3
1100	C3
1102	C3
1103	A3
1104	A2
1105	C3
1106	B3
1203	A1
1400	C1
1500	B3
1505	B3
1704	A2
1900	A1
1901	A2
1904	A3
2000	B3
2001	B3
2002	B3
2003	B3
2014	B3
2015	A3
2023	B3
2026	A3
2033	B3
2035	A3
2037	A3
2044	B3
2046	A1
2049	B3
2050	B3
2054	A3
2056	A3
2058	A3
2059	A3
2060	B3
2062	B3
2064	A3
2065	A3
2071	A3
2100	D3
2102	C3
2104	C3
2105	C3
2106	C3
2107	C3
2109	C3
2110	C3
2111	C3
2114	D3
2116	D3
2127	D2
2128	D3
2129	C3
2200	A1
2201	A1
2204	A1
2205	A1
2212	B1
2235	A1
2236	A1
2238	B1
2300	B1
2301	B1
2302	B2
2303	B1
2304	B1
2305	B1
2306	B1
2307	B1
2308	B1
2309	B1
2310	B1
2311	C1
2312	B1
2400	D2
2401	D2
2402	C2
2403	D2
2408	D1
2433	C1
2435	C2
2436	C1
2525	B3
2526	B3
2700	B2
2703	A2
2704	B2
2705	A2
2711	A2
2717	A2
2722	A2
2723	A2
2725	A2
2728	A2
2729	A2
2730	A3
2731	A3
2832	D2
2833	D2
2900	A3
2901	A3
2903	A3
2904	A3
2905	A3
2906	A3
2907	A3
2908	A3
2909	A3
2910	A2
2912	A3
2914	A3
2915	A3
2918	A2
2919	A1
2920	A2
2922	A2
2924	A3
2926	A3
2927	A3
2930	A1
2931	D3
2933	A3
2935	A3
2936	A3
2938	D3
2939	A3
2940	A3
3005	B3
3008	B3
3010	B3
3013	A3
3015	B3
3016	B3
3017	B3
3018	B2
3019	B3
3023	A3
3026	A3
3085	C1
3086	C1
3087	A1
3088	C1
3094	C3
3101	C3
3103	C3
3104	D3
3106	C3
3108	C3
3110	C3
3112	C3
3113	D2
3116	C3
3118	C3
3120	C3
3122	C3
3124	C3
3126	C3
3128	C3
3130	C3
3131	C3
3133	C3
3135	C3
3136	C3
3138	C3
3139	C3
3140	C3
3141	C3
3143	C3
3145	C3
3146	D3
3147	C3
3149	D3
3152	C3
3154	D3
3156	D3
3157	C3
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3164	D3
3167	D3
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3170	D3
3172	D3
3175	D3
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3208	B1
3209	A1
3210	B1
3211	B1
3212	A1
3213	A1
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3218	B1
3220	B1
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3240	A1
3241	B2
3242	B1
3243	B2
3244	B2
3245	B1
3246	B2
3247	B2
3248	A1
3249	B2
3251	B2
3252	B2
3254	B2
3255	B2
3256	B2
3257	B1
3258	B2
3259	B2
3260	A2
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3273	A2
3275	B2
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3278	A2
3284	A1
3294	A2
3295	A2
3296	A2
3297	A2
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3299	B2
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3301	B1
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3305	B1
3306	B1
3307	B1
3308	B1
3309	B1
3310	B1
3311	B1
3316	B2
3317	B2
3318	B2
3319	B2
3402	D2
3403	C2
3404	C2
3405	D2
3406	D2
3407	C2
3408	C2
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3411	C2
3413	C2
3416	C2
3417	C2
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3426	C1
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3430	C1
3431	C1
3432	C1
3436	C1
3437	C1
3438	C1
3439	C1
3440	C1
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3443	D1
3444	D1
3445	D1
3446	D1
3447	D2
3448	D2
3449	D2
3450	D2
3451	D2
3452	D1
3453	D2
3454	D2
3455	D2
3456	D2
3457	D2
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3459	D2
3460	D2
3461	D2
3462	D2
3463	D2
3464	D2
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3496	D2
3497	C1
3498	C1
3499	C1
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3701	A3
3702	A3
3725	A2
3727	C2
3729	A2
3731	B3
3732	C2
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3829	B1
3830	B1
3831	B1
3832	B2
3833	B2
3834	B2
3835	B2
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3853	C1
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3867	C2
3868	C1
3869	C1
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3906	A3
3907	A3
3908	A3
3909	A1
3910	A1
3911	A3
3912	A3
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3917	A2
3918	A3
3919	A3
3922	A2
3924	A3
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3929	A2
3930	A3
3931	A3
3934	A3
3936	A3
3938	A3
3941	A3
3942	A3
3943	A3
3944	A3
3945	A3
3946	A3
3947	A3
3950	A3
3951	A3
3952	A3
3953	A3
3954	A3
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4002	B3
4005	B3
4119	C1
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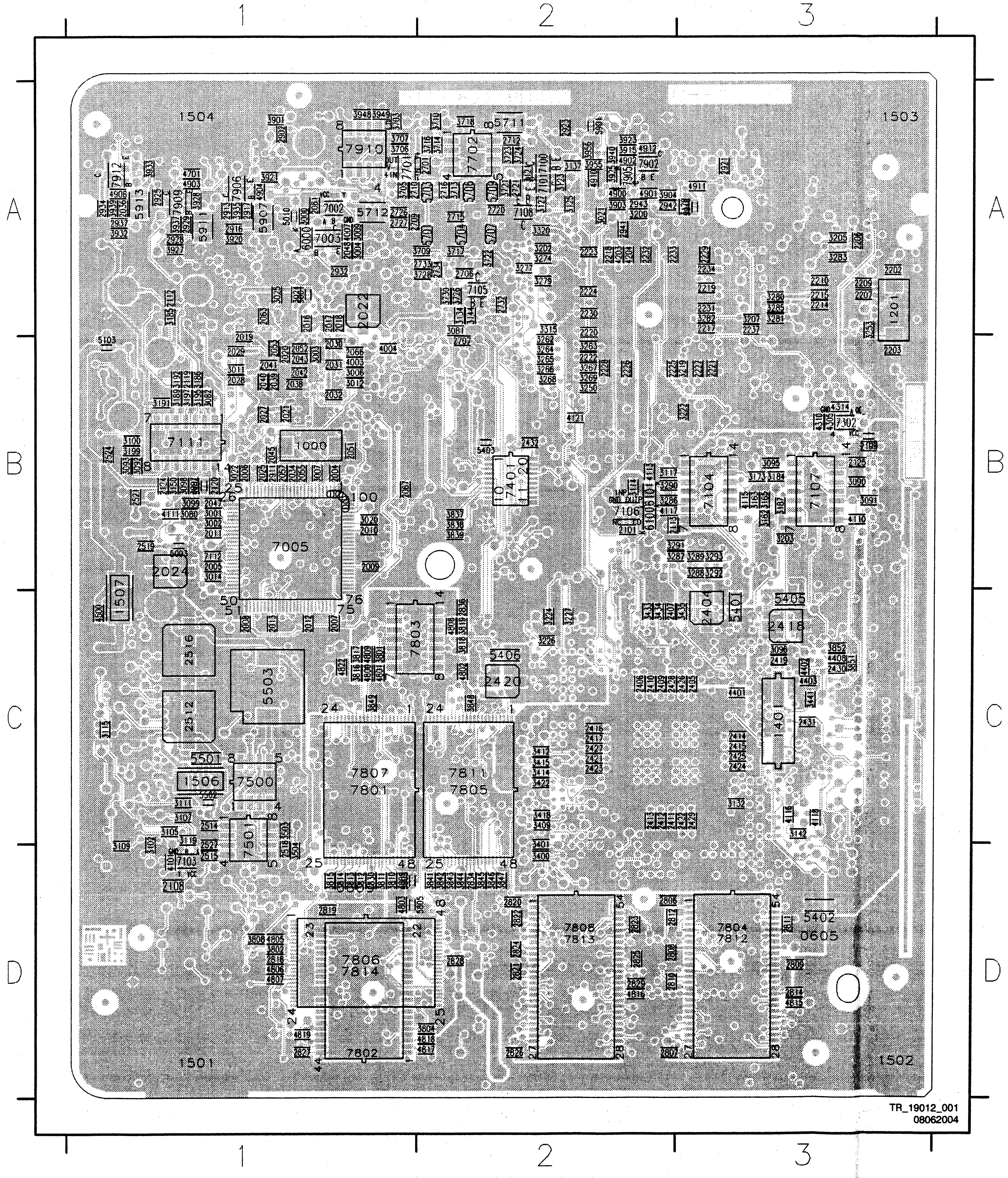
4123	D2
4124	D3
4125	D3
4201	B1
4202	A1
4205	A1
4300	B1
4301	B1
4302	B1
4303	B1
4304	C1
4306	B1
4307	C1
4308	B1
4309	B1
4311	B1
4312	B1
4313	B1
4315	B1
4316	C1
4404	B2
4405	B2
4406	B2
4407	B2
4702	A3
4703	A3
4728	A2
4729	A2
4730	A2
4804	C3
4812	C3
4813	C2
4814	C2
4905	A3
4907	A3
4908	A2
4909	A2
5002	B3
5005	B3
5008	B3
5009	B3
5011	B3
5102	D3
5108	D2
5200	A1
5201	B2
5202	A1
5203	A1
5204	B1
5300	B1
5301	B1
5302	B1
5400	D2
5404	C1
5700	B2
5713	A3
5714	B2
5802	D1
5804	D2
5808	D2
5809	D2
5902	A3
5903	A3
5904	A2
5905	A1
5906	A1
5908	A3
5909	A1
5910	A3
5912	A3
5914	A1
5915	A2
6103	D3
6200	B2
7001	B3
7004	B3
7008	C3
7102	D3
7109	D3
7200	A1
7201	A2
7202	B2
7300	B1
7301	B1
7303	C1
7304	C1
7305	B1
7400	C2
7402	C1
7403	C1
7703	A2
7704	A2
7809	C3
7810	D3
7900	A1
7901	A2
7903	A2
7904	A3
7907	A3
7908	A3
7911	A3

Layout Digital Board Chrysalis 2.1 (Bottom View)



1000	B1	2405	C3	2941	A2	3277	A2	3928	A1	6000	A1
1201	A3	2406	C2	2942	A2	3279	A2	3932	A1	6100	B2
1401	C3	2407	C2	2943	A2	3280	A3	3933	A1	6101	B2
1506	C1	2409	C2	3000	A1	3281	A3	3935	A1	7002	A1
1507	C1	2410	C2	3001	B1	3282	A3	3937	A1	7003	A1
2004	B1	2411	C2	3002	B1	3283	A3	3939	A1	7005	B1
2005	B1	2412	C2	3003	B1	3285	A3	3940	A2	7100	A2
2006	B1	2413	C2	3004	A1	3286	B2	3948	A1	7101	A2
2007	C1	2414	C3	3006	B1	3287	B2	3949	A1	7103	D1
2008	C1	2415	C3	3007	B1	3288	B3	3955	A2	7104	B3
2009	B1	2416	C2	3009	A1	3289	B3	3956	A2	7105	A2
2010	B1	2417	C2	3011	B1	3290	B2	4003	B1	7106	B2
2011	B1	2418	C3	3012	B1	3291	B2	4004	B1	7107	B3
2012	C1	2419	C3	3014	B1	3292	B3	4007	A1	7108	A2
2013	C1	2420	C2	3020	B1	3293	B3	4101	D1	7111	B1
2016	A1	2421	C2	3021	A2	3315	A2	4110	B3	7112	B1
2017	A1	2422	C3	3022	B1	3320	A2	4111	B1	7302	B3
2018	A1	2423	C2	3024	A1	3400	D2	4113	B2	7401	B2
2019	B1	2424	C3	3025	A1	3401	D2	4115	B3	7500	C1
2020	B1	2425	C3	3080	B1	3409	C2	4116	C3	7501	C1
2021	B1	2426	C3	3081	A2	3412	C2	4117	B2	7701	A1
2022	A1	2427	C2	3082	B1	3414	C2	4118	C3	7702	A2
2024	B1	2428	C2	3090	B3	3415	C2	4121	B2	7801	C1
2025	B1	2429	C3	3091	B3	3418	C2	4203	A2	7802	D1
2027	B1	2430	C3	3092	B1	3422	C2	4204	A2	7803	C1
2028	B1	2431	C3	3093	B1	3433	C2	4305	B3	7804	D3
2029	B1	2432	B2	3095	B3	3434	C2	4310	B3	7805	C2
2030	B1	2512	C1	3096	C3	3435	C3	4314	B3	7806	D1
2031	B1	2514	C1	3097	B1	3441	C3	4401	C3	7807	C1
2032	B1	2515	D1	3098	B1	3503	C1	4402	C3	7808	D2
2034	B1	2516	C1	3099	B1	3504	D1	4403	C3	7811	C2
2036	A1	2518	D1	3100	B1	3703	A1	4408	C3	7812	D3
2038	B1	2519	B1	3102	D1	3705	A1	4500	C1	7813	D2
2039	B1	2521	B1	3105	C1	3706	A1	4701	A1	7814	D1
2040	B1	2524	B1	3107	C1	3707	A1	4800	C1	7902	A2
2041	B1	2527	D1	3109	D1	3709	A2	4801	C1	7905	A2
2042	B1	2701	A2	3111	C1	3710	A2	4802	C2	7906	A1
2043	B1	2706	A2	3114	B2	3713	A2	4803	D1	7909	A1
2045	B1	2707	B2	3115	C1	3714	A2	4805	D1	7910	A1
2047	B1	2709	A1	3117	B2	3716	A2	4806	D1	7912	A1
2048	A1	2710	A1	3119	C1	3717	A2	4807	D1		
2051	B1	2712	A2	3121	A2	3718	A2	4808	C2		
2052	B1	2715	A2	3123	A2	3721	A2	4809	C1		
2053	B1	2716	A2	3125	A2	3722	A2	4815	D3		
2055	B1	2720	A2	3127	A2	3723	A2	4816	D2		
2057	B1	2721	A2	3129	A3	3724	A2	4817	D2		
2061	A1	2726	A1	3132	C3	3726	A2	4818	D2		
2063	A1	2727	A1	3134	A2	3728	A2	4819	D1		
2066	B1	2732	A2	3137	A2	3730	A2	4822	C1		
2067	B1	2733	A2	3142	C3	3801	C1	4900	A2		
2101	B2	2734	A2	3144	A2	3802	D1	4901	A2		
2103	B3	2806	D2	3150	B1	3804	D2	4902	A2		
2108	D1	2807	D2	3162	B3	3808	D1	4903	A1		
2112	A1	2808	D2	3163	B3	3809	D1	4904	A1		
2113	B2	2809	D3	3165	B3	3810	D1	4906	A1		
2119	B1	2810	D2	3173	B3	3811	D1	4910	A2		
2120	B1	2811	D3	3184	B3	3812	D1	4911	A3		
2124	B1	2812	D2	3185	A1	3813	D1	4912	A2		
2125	B3	2814	D3	3186	B1	3814	D1	5001	A1		
2202	A3	2818	D1	3187	B3	3815	D1	5003	B1		
2203	B3	2819	D1	3189	B1	3816	C1	5010	A1		
2206	A3	2820	D2	3191	B1	3817	C1	5100	B3		
2207	A3	2821	D2	3192	B1	3818	C2	5103	B1		
2209	A3	2822	D2	3195	B1	3819	C2	5104	B1		
2210	A3	2823	D2	3197	B1	3837	B2	5401	C3		
2214	A3	2824	D2	3199	B1	3838	B2	5402	D3		
2215	A3	2825	D2	3200	A2	3839	B2	5403	B2		
2217	A3	2826	D2	3202	A2	3841	D2	5405	C3		
2218	A2	2827	D1	3203	B3	3842	D2	5406	C2		
2219	A3	2828	D2	3205	A3	3843	D2	5501	C1		
2220	A2	2829	D2	3207	A3	3844	D2	5502	C1		
2221	B3	2830	D1	3219	B3	3845	D2	5503	C1		
2222	B2	2834	D2	3222	B3	3846	D2	5701	A2		
2223	A2	2836	C2	3224	C2	3847	D2	5703	A2		
2224	A2	2902	A1	3226	C2	3848	C2	5704	A2		
2225	B2	2911	B1	3227	C2	3849	C1	5706	A2		
2226	B2	2913	A1	3250	B2	3851	C3	5707	A2		
2227	B3	2916	A1	3253	A3	3852	C3	5709	A2		
2228	B2	2917	A1	3262	B2	3901	A1	5711	A2		
2229	A3	2921	A3	3263	B2	3903	A2	5712	A1		
2230	A2	2923	A2	3264	B2	3904	A2	5803	D1		
2231	A3	2925	A1	3265	B2	3915	A2	5805	D2		
2232	A2	2928	A1	3266	B2	3920	A1	5901	A2		
2233	A2	2929	A1	3267	B2	3921	A1	5907	A1		
2234	A3	2932	A1	3268	B2	3923	A2	5911	A1		
2237	A3	2934	A1	3269	B2	3925	A2	5913	A1		
2404	C3	2937	A1	3274	A2	3927	A1	5916	A3		

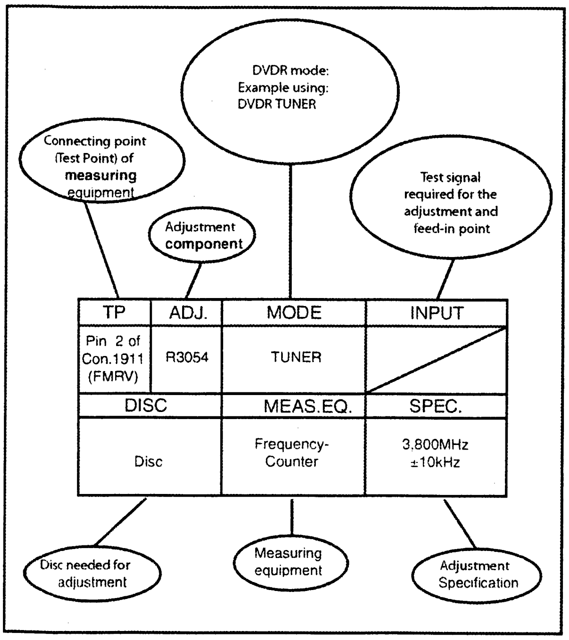
8. Alignments

8.1 Alignment Instructions Analog Board

Test equipment:

1. Dual-trace oscilloscope
   Voltage range : 0.001 ~ 50 V/div
   Frequency : DC ~ 50 MHz
   Probe : 10:1, 1:1
2. DVM (Digital voltmeter)
3. Frequency counter
4. Sinus generator
   Sinus : 0 ~ 50 MHz
5. Test pattern generator

How to read the adjustment procedures:


DVDR mode:
Example using:
DVDR TUNER
Connecting point (Test Point) of measuring equipment
Adjustment component
Test signal required for the adjustment and feed-in point
TP
ADJ.
MODE
INPUT
Pin 2 of Con.1911 (FMRV)
R3054
TUNER
DISC
MEAS.EQ.
SPEC.
Disc
Frequency-Counter
3,800MHz ±10kHz
Disc needed for adjustment
Measuring equipment
Adjustment Specification

Front End (FV)

Service tasks after replacement of IC 7710, coil L5710 and L5711:

1 AFC Adjustment:

Purpose: Correct adjustment of demodulator AFC - circuit
Symptom, if incorrectly set:
Bad or disturbed TV channel reception.

PAL - AFC adjustment [5711]:

TP	ADJ.	MODE	INPUT
IC 7710 Pin 17 (F708)	L5711	TUNER	38,9MHz 500mV$_{pp}$ at Tuner 1705, Pin 11 (F710, IF-out)
DISC		MEAS.EQ.	SPEC.
		DC Voltmeter Frequ. Generator	2.5V ±0,1V

Storage in NVRAM via command mode interface of DSW:
After adjustment, the AFC reference value has to be stored in the NVRAM.
This reference value is 256 * measured voltage/Ucc. Ucc is 5.0V.
Store the reference value via command 1119 , followed by the ref. value.
Example: DD:> 1119 128

2 HF - AGC adjustment [3724]:

Service tasks after replacement of IC 7710:

Purpose: Set amplifier control.

Symptom, if incorrectly set:
Picture jitter if input level is too low and picture distortion if input level is too high.

TP	ADJ.	MODE	INPUT
Tuner 1705 Pin 11 (F710, IF-out)	R3707	Set tuned to channel 25 503.25 MHz	5mV(74dBμV) on aerial input PAL white picture, audio IF on, no modulation
DISC		MEAS.EQ.	SPEC.
		Oscilloscope Video Pattern Generator	500mV$_{pp}$ +/-0.5dB (use a 10:1 probe)

3 Attenuating the 40.4 MHz [5710]: (SECAM only)

Service tasks after replacement of coil 5710:

Purpose: To attenuate the band I carrier rests.

Symptom, if incorrectly set:
Bad picture quality when the filter attenuates the picture carrier (38.9MHz).

TP	ADJ.	MODE	INPUT
OFW 1701 Pin 1 (F709)	L5710	TUNER	40.4 MHz, 200mV$_{rms}$ at Tuner 1705, Pin 11 (F710, IF-out)
DISC		MEAS.EQ.	SPEC.
		Oscilloscope, Sinus Generator, Counter	adjust minimum amplitude

If the adjustment is correct the signal at pin 1 of OFW [1701] must be smaller than the input signal amplitude by at least 6 dB.

Figure 8-1

8.2 Reprogramming Procedure of NVM on the Microprocessor Sub PCB

The NVM, item 7808, on the Microprocessor Sub board contains the following factory settings:

1. Clock correction factor
2. AFC reference value
3. Slash version

The settings 1,2 and 3 are stored in the NVM during the production of the analogue board.
The slash version is stored at the end of the production line of the set.
In case of failure, the NVM must be replaced by an empty device. By way of commands via the Diagnostic Software or via ComPair, the factory settings must be restored in the NVM.

8.2.1 Clock Correction Adjustment

To guarantee an exact function of the real time clock, an adjustment of the clock frequency is possibe. The adjustment value is stored in the NVM.
Procedure:

- put the set in service command mode
- execute command 1117 to initiate that a signal with 32768 Hz is available on pin 3 of connector 1988
  example:
  DD:>1117
- measure the frequency fmeas of the Clock Crystal with an accuracy of 0.1 Hz.
- Calculate the parameter to be entered: 32768/fmeas * 106
- Normally the parameter must be between 999902 and 1000097. If the parameter and therefore the frequency of the crystal is outside this range, the crystal must be replaced.
- Execute command 1118 with the parameter as input
  example:
  DD:>1118 1000023

8.2.2 AFC Reference Voltage Tuner

This function stores the reference voltage for the tuner in the NVM. Before this value can be stored, the AFC adjustment, described in the adjustment instructions of the analogue board, must be carried out.
Procedure:

- Adjust AFC circuit
- Calculate the reference value
- Execute command 1119 and use the calculated reference value as parameter example: DD:>1119 128

8.2.3 Slash Version

The slash version is stored with command 1217, followed by the slash version as parameter.
The slash versions used in DVDR730/0x are the following:

- DVDR730/00/02: 73
- DVDR730/05: 76

Example:
DD:>1217 65

Reset of Slash Version
Use command 1115 to reset the analogue board to the default setting.
Procedure:

- Put the set in DSW command mode
- Execute command 1115 with the following parameters:
  DD:> 1115 w 0xAE 2 0xD0 0x00
- Leave the DSW command mode and start up the set in application mode
  No background is visible on the TV screen. The analogue board is ready to accept the appropriate slash version

8.3 Rework Procedure IEEE Unique Number

8.3.1 Scope:

The procedure describes how to upgrade sets with a unique number after repair. This unique number is stored in the NVRAM (item 7809) of the digital board at the end of the production line.
This procedure is only valid or necessary when:

- The digital board is replaced
- NVRAM on the digital board is replaced
- NVRAM is cleared

In all other cases the repaired set retains its unique number.
The procedure defines several means to re-assure the unique number depending on the possibilities of repair or the state the faulty set is in.

8.3.2 Handling:

State of original (defective) board:

1. The digital board starts up in Diagnostics Mode: follow procedure A to retrieve the valid unique number
2. The digital board does NOT start up in Diagnostics Mode: follow procedure B.

8.3.3 Procedure A

1. Connect defective digital board to PC via serial cable (3122 785 90017)
2. start up hyper terminal or any other serial terminal via the correct settings (DSW command mode interface)
3. read out existing unique number via nucleus 1208
   example:
   DD:> 1208
   120800: DV Unique ID = 00D7A1FC6C Test OK @
4. note read out
5. program new digital board via nucleus 1207
   example:
   DD:> 1207 00D7A1FC6C 120700: Test OK @

The set has now the original unique number

8.3.4 Procedure B

1. Note the serial number of the set example:
   VN050136130156
   - VN = production centre (VN....Szekesfehervar).
     According to UAW-500: V=22 and N=14
   - 05 = change code (this is not used for this calculation)
   - 01 = YEAR

   - 36 = Production WEEK
   - 130156 = Lot and SERIAL number
2. Calculate the unique number: this number always exists out of 10 hexadecimal numbers.
3. First 5 numbers: First we calculate a decimal number according to the formula below:
   35828*YEAR + 676* WEEK + 26*V + N+ 8788
   The figures are fixed, YEAR + WEEK + factory code (V+ N) are variable
   Example: 35828*01+676*36+26*22+14+8788 = 69538 (decimal)
   Then we translate the decimal number to a hexadecimal number. example: 69538 (decimal)= 10FA2 (hex)
4. Last 5 numbers: The last 5 numbers exist out of the Lot and SERIAL number according formula below:
   serial nr + 1 * 100000
   Example: 130156 + 100000 = 230156 (decimal)
   230156 (decimal) = 3830C (hex)
5. Program new digital board via nucleus or 1207. Therefore we use the 10 hexadecimal numbers we calculated above:
   example:

   ```
   >1207 10D7A3830C
   12700: Test OK @
   ```

The set has now its original unique number

8.4 Alignments after replacing the Boot EEPROM 7810 in sets with Digital Board Chrysalis

The NVM, item 7810, on the Digitalt Board Chrysalis contains the “Diversity String” that tells the software during startup which hardware version is present.
The setting is stored in the NVM during the production of the Digital Board Chrysalis
In case of a fault the NVM must be replaced by a programmed device containing the boot script.
Via the Diagnostic Software the Diversity String is stored with command 1226, followed by the Diversity String as parameter.

The diversity strings used in DVDR77/0x1 are the following:

ChrysalisString
Board
Type
E5_AV3_PLUS
44424849F27E200145355F4156332B003904030002010102
0001000040080000
Example:

```
DD:> 1226 44424849F27E200145355F4156332B00390403
0002010102000100004008000
122600
Test OK @
```

With command 1228 the settings can be displayed.

9. Circuit-, IC descriptions and list of abbreviations

9.1 Display Board

9.1.1 Microcontroller

The core element of the Display Control unit is the microcontroller TMP87CH74AF [7103]. The TMP87CH74AF is an 8 bit microcontroller fitted with 32kB ROM and 1kB RAM. It requires 5V supply and is responsible for the following functions:

- Interface to Central Controller-P
- Evaluation of the keyboard matrix
- Decoding the remote control commands from the infra-red receiver
- Activation and control of the local display
- Heater voltage generation

The 8 MHz resonator (Pos. 1110) generates the system clock. The reset is generated by the CC-P via "POR_DC"-signal where the transistor [7104] is used as a level-shifter from 3V3 to 5V.

9.1.2 Interface to the Central Control μP

The communication to the main microcontroller (CC) on the P-Sub-PCB is done via I2C-Interface, where the TMP87CH74AF acts in slave-mode.
An additional wire ("INT"-line) is used to signal the Central controller that data are ready, e.g. when a key has been pressed.

9.1.3 Evaluation of the keyboard matrix

There are 12 different keys on the display board. A resistor network is used to generate a specific direct voltage value, depending on the pressed key. Via the resistors 3107 and 3102 on the analog/digital (A/D) ports (7103 pin 36 and 37) the evaluation is done.

9.1.4 IR receiver and signal evaluation

The IR receiver [7107] contains a selectively controlled amplifier as well as a photo-diode. The photo-diode changes the received infra red transmission (approx. 940nm) to electrical pulses, which are then amplified and demodulated. On the output of the IR receiver [7107], a pulse sequence with TTL-level, which corresponds to the envelope curve of the received IR remote control command, can be measured. This pulse sequence is fed into the controller for further processing via port TC1 [7103, pin20].

9.1.5 Vacuum Fluorescence Display

The VFD "BJ900GNK" [POS 7100] is fully controlled by the microcontroller. The μC also includes the driving stages. Only two additional drivers [POS 7101 and 7102] are necessary for the grids 8 and 9 because of their large size.

9.1.6 VFD Heater Voltage Generator

The circuit around POS [7106, 7108 and 7109] is used to generate a proper AC-Voltage for the filament of the VFD. For this the microcontroller generates an appropriate rectangular signal with 50% duty-cycle and a frequency of 30 kHz at pin 19. Pos. [5104] and [2113] are acting as a resonance-circuit. Via Zener-Diode (POS[6100]) and resistors [3119, 3122 and 3123] the two heater-pins of the VFD ("FIL1" and "FIL2") are clamped so that the grids and segments can be fully switched off.

9.1.7 REC-LED

The REC-LED-ring is made with 3 red LED, controlled via pin 3 (only for flashing) and pin 12 for on/off switching, of the microcontroller. The POS [7105] is used as a driver for the led.

9.1.8 EPG-LED

The EPG led is a white led and controlled from the pin 14 from the microcontroller. The POS [7110] is used as a driver for the led.

9.1.9 TRAY-LED

There are 6 leds (chip) necessary to illuminate the tray, these 6 leds are located on a little sub-pcb connected over a 4 pin connector POS [1911] from the DC-print. The leds are controlled from pin 11 of the microcontroller.

9.2 Microcontroller Sub Board (UP SUB Board)

9.2.1 General

This small PCB is directly soldered in on top of the Analogue-Board.
It is used with no diversity in all three different basic versions (Europe, NAFTA and APAC-Pal). Only the software being loaded into the external Flash-memory is not the same.

9.2.2 Microcontroller

The main part of the Sub-PCB is the central controller (CC) μP [7804] TMP91CW12AF, which is a 16-bit CPU with 128kBROM and 4kB RAM.
It works with a 3V3 supply and a system clock of 24,576MHz [1801].
The 3V3-supply is made out of the "5VSTBY" by the circuit around [7816].
After connecting the set to the mains (power-up) the IC [7806] generates a reset pulse. This signal ("IPOR") is directly fed to first priority interrupt input (pin 63) for power fail detection and also to the Reset-Input of the CC (Pin30) via [7802], which is necessary to generate a reset only during power-up. In case of power fail pin 30 of the CC must be kept high (3V3).
The internal memory of the CC is too small for all necessary demands. Therefore an external Flash-ROM [7805] with 1MByte in size and a RAM [7803] with 128kByte are necessary. Both parts are connected to the μP via a parallel address-/data-bus. The lower eight bus-lines (AD0 to AD7) are multiplexed by [7801] and the "ALE"-signal of the CC.
For updating of the software the external Flash-ROM can be reprogrammed by the μP. During this process [7807] is switched on by the "WE"-signal.
When no mains is connected, the CC is supplied via Gold-Cap [2816] during the power backup period. The diode [6802] prevents unwanted current consumption of other components. The internal ROM of the μP holds the program code for the Real-Time-Clock. Only the microprocessor is supplied by the backup cell, not the external memories and the μP operates in a low frequency mode with the clock crystal [1805] only (32.768 kHz). To adjust the clock the frequency can be measured at pin 87 of the μP in a special test-mode.

9.2.3 Control-Interfaces

The CC is communicating with the digital board via a serial connection, which operates at a speed of 19,4 kbit/s ("D_DATA"-, "A_DATA", "D_RDY"- and "A_RDY"-signal on

[1986]). By generating a high level on pin 16 of the CC the digital PCB can be reset (inverter [7817] in between).
Most of the other parts are controlled by the µP via I2C-bus ("SDA"- and "SCL"-signal). The FETs [7821] and [7822] are used for adaptation of the 3V3-level on CC-side to the components supplied with 5V.
The CC can also reset the display-board-µP by pulling pin 39 to high.
The transistor [7819] acts as a level shifter for the "INT"-signal.
In the European sets a bi-directional interface is established between the recording unit and the TV device at pin 10 of the Scart ("P50"-line/Easy Link). The processing is done via pin 14 (output) and pin 38 (input) of the CC and the circuit around [7813], [7814] and [7815].

9.2.4 EEPROM

The EEPROM M24C16 [7808] is an electrical erasable and programmable, non-volatile memory. The EEPROM stores data specific to the device, such as the AFC-reference value of the Europe IF-part, the clock-correction-factor, etc. It is accessed by the µP via the I2C-bus.

9.2.5 Sync Separator

To detect whether a video signal is available or not a separate IC [7825] is used to extract the sync information out of the video signal that is also routed to the digital board for recording.
While on the input a low-pass-filter ([2823] and [3869]) limits the bandwidth an additional filter (circuit
around [7818]) on the output avoids distortions. Afterwards the sync-signal is routed to pin11 of the CC.

9.2.6 Fan Control

To avoid unwanted temperatures inside the set (especially the Laser on the OPU of the drive is very sensitive) a fan is located on top of the basic engine. The speed control is dependent on the ambient temp. A NTC resistor [3134] located on the display board measures the temperature. An operational amplifier [7902-B] generates a proper voltage, which is then fed to the engine ("BE_FAN"-line). Below 28°C ambient temp. the fan-voltage is approx. 5V and is increased to 10V when the ambient temperature goes up to approx. 38°C. The second part of the Op-Amp. [7902-A] prevents damage of any temperature-sensitive part in case the NTC or the wire in between is damaged. It acts as a comparator and pulls the "BE_FAN"-signal to 10V. As the fan has to be stopped in case the tray of the drive is open this voltage is "killed" by the CC ("FAN_OFF"-signal). The double-diode [6901] acts for both Op.-Amp.-circuits. The circuit is also prepared for a set-fan (circuit around the Op-Amp. [7902-C]).

9.3 Analog board Europe

9.3.1 General

This PCB consists out of the following parts:
- Power-Supply-Unit
- Frontend (Audio & Video)
- Input-/Output-switching
- Audio ADC- & DAC-processing
- VPS/PDC- and Text-Data slicer
- Analog Follow-Me Circuit

All functional groups are either controlled via I2C-bus or via separate signal lines by the Central-Controller on the µP-Sub-Board. This sub board is directly soldered in onto the analog PCB. During Stand-By mode of the set, several parts are not supplied (Tuner, MSP, ...). The microprocessor is running and maintains the clock of the set.
To avoid bus blockades the I2C-bus ("SCLSW" & "SDASW") to/from these units is decoupled via transistors [7419], [7420] from the general bus ("SCL" & "SDA").

9.3.2 Power Supply Unit

Functional principle:
This power supply works in the way of a flyback converter. In the mains input part [1931 to 2309], the mains voltage is rectified and buffered in the capacitor [2309]. From this direct voltage at [2309] energy is transferred into the transformer [5300, pins 7-5] during the conductive phase of the switching transistor [7307] and is stored there as magnetic energy. This energy is passed to the secondary outputs of the power supply in the blocking phase of the switching transistor [7307]. With the switch-on time of the switching transistor [7307], the energy transferred in every cycle is regulated in such a way that the output voltages remain constant regardless of changes in the load or mains voltage. The power transistor is driven by the integrated circuit [7313].

Mains input part:
The mains input part extends from the mains socket [1931] to the capacitor [2309]. The diodes [6301, 6302, 6305 and 6306] rectify the AC supply voltage, which is then buffered by the capacitor [2309]. The common mode coil [5302] and capacitor [2302] work as a filter to block interference arising in the power supply from the mains. Components [1302], [3306] and [3304] protect the power supply against short-term over voltages in the mains, e.g. caused by indirect lightning.

Start-up with Mains-on:
After connecting the power cord to the mains, the capacitor [2325] is loaded via a current source between pin 8 and pin 1 in the IC [7313]. Once the voltage on [2325] and therefore the supply voltage Vcc of the IC [7313] has reached approx. 11V, the IC starts up and provides pulses at its output pin 5. These pulses are used to drive the gate of the power transistor [7307]. The frequency of these pulses is depending on load and mains voltage. The current consumption of the IC is approx. 5 mA at Vcc in normal mode.
If Vcc drops to below approx. 9V (e.g. with power limitation) or if Vac exceeds approximately 16V (e.g. interruption of the control loop), the output of the IC [7313, pin 5] is blocked and a new start-up cycle begins. (See also "Overload, Power Limitation, Burst Mode" section)

Normal operation:
With the power supply in normal mode, the periodic sequences in the circuit are divided primarily into the conductive and blocking phase of the switching transistor [7307]. During the conductive phase of the switching transistor[7307], current flows from the rectified mains voltage at capacitor [2309] through the primary coil of the transformer [5300, pins 7-5], the transistor [7307] and resistors [3321, 3352] to ground. The positive voltage on pin 7 of the transformer [5300] can be assumed as constant for a switching cycle. The current in the primary coil of the transformer [5300] increases linearly. A magnetic field representing a certain value of the primary current is formed inside the transformer. In this phase, the voltages on the secondary coils are polarized such that the diodes [6300, 6303, 6307, 6308, 6310, 6313, 6317 and 6319] block. From the controller [7315] a current is supplied into the CTRL input on the IC [pin 3, 7313] via optocoupler [7314]. Once the switch on time of the switching transistor[7307] - that corresponds to the current supplied into the CTRL input - has been reached, the switching transistor [7307] is switched off. When the switching transistor has been switched off, the blocking phase begins. No more energy will be transferred into the transformer. The inductivity of the transformer will still attempt to keep the current flowing at a constant level (U=L*di/dt). Switching off transistor [7307] interrupts the primary current circuit. The polarity of the voltages on the transformer is reversed, which means that the diodes [6300, 6303, 6307, 6308, 6310, 6313, 6317 and 6319] become conductive and current flows into the capacitors [2305, 2312, 2319, 2322, 2326 and 2328] and the load. This current is also ramp-shaped (di/dt negative, therefore decreasing).

The feedback control for the switched-mode power supply is done by changing the conductive phase of the switching transistor so that either more or less energy is transferred from the rectified mains voltage at [2309] into the transformer. The regulation information is provided by voltage reference [7315]. This element compares the 5V-output voltage via voltage divider [3332, 3333, 3334] with an internal 2.5V reference voltage. The output voltage of [7315] passes via an optocoupler [7314] for insulation of primary and secondary parts as a current value into pin 3 on the IC [7313]. The switch-on time of the transistor [7307] is inversely proportional to the value of this current.

Overload, power limitation, burst mode:
With increasing load on one or more of the power supply outputs, the switch-on time for the power transistor [7307] increases, and thus also the peak value of the delta-shaped current through this power transistor. The equivalent voltage of this current profile is passed from resistors [3321] and [3352] via [3365] to pin 5 of the IC [7313]. If the voltage on pin 2 reaches approx. 0.4V in one switching cycle, the conductive phase of the switching transistor is ended immediately. The check is done in each individual switching cycle. This process ensures that no more than approx. 60W can be taken out from the mains (= power limitation).
If the power supply reaches the power limit, the output voltages and the supply voltage Vcc on pin 1 of the IC [7313] will be reduced following further loading. If Vcc is less than approx. 9V at any point during this process, the output of the IC [7313, pin 6] is blocked. All output voltages and Vcc decrease and a new start-up cycle begins. If the overload status or short-circuit remains, the power limitation will be activated immediately and the voltages will again decrease, followed by another start-up cycle (Burst Mode). The amount of power taken up from the mains in burst mode is low.

Standby modes:
In the 'AV-Standby' operating mode of the set, the 'ION' control line is primarily used to switch off all output voltages for Basic Engine and Digital Board (supplies 3V3, 5V, 12V, 5N and 4V6 at Connectors 1932 and 1933) of the power supply. This reduces the amount of power taken from the mains. In Low Power Standby mode additionally the 'STBY' control line is used to switch off output voltages 5SW and 8SW. This reduces power consumption to less than 3W, if additionally the display is switched off. The power supply will continue operating in Standby mode with a switching frequency of approx. 25 kHz.

9.3.3 Frontend

This unit is designed to support two basic versions, which are distinguished by a different assembly variant only (one for multistandard and the second for Pal-I only) and comprises the following parts:

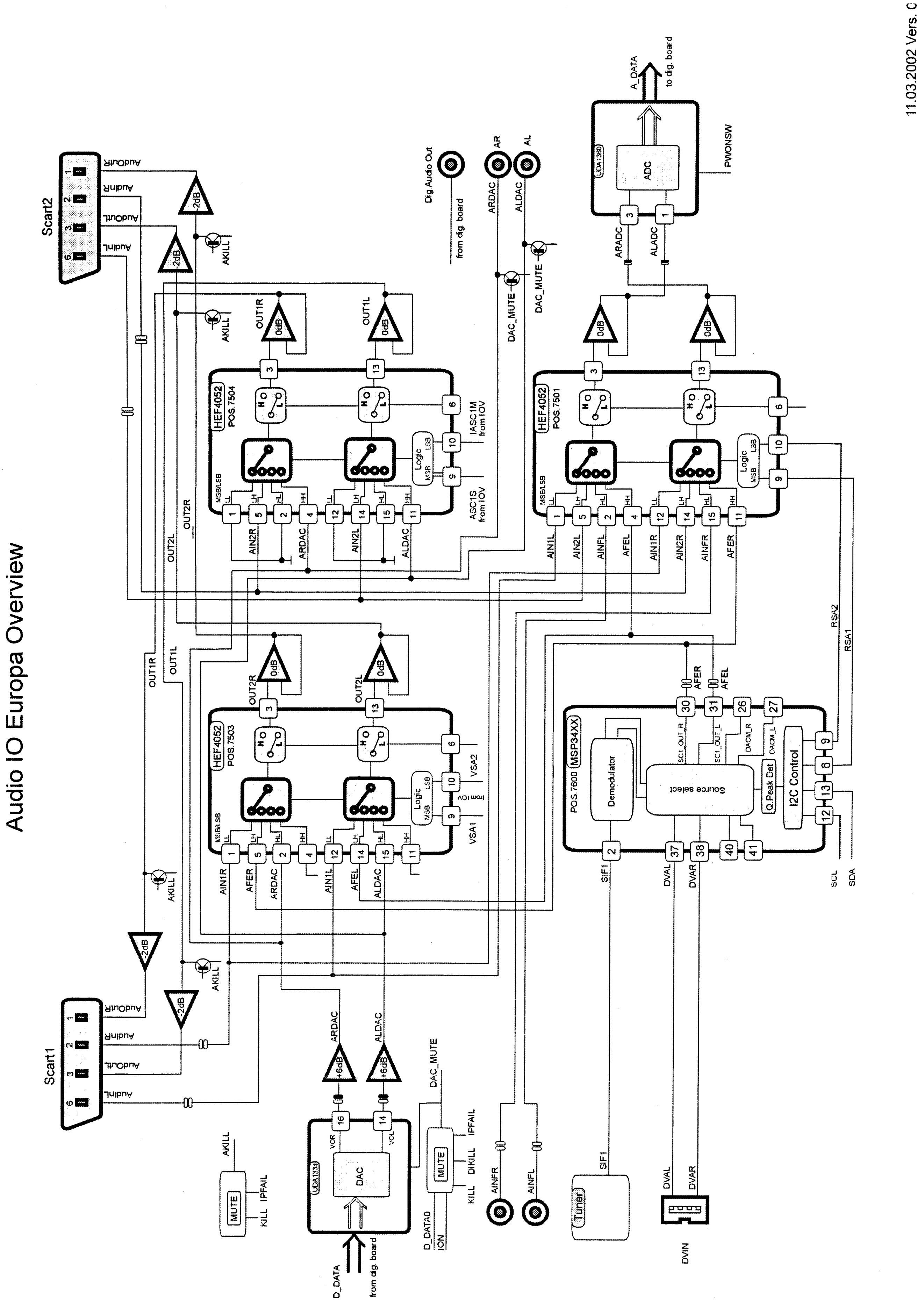
- Tuner UV1316K [1705]
- IF amplifier & video demodulator IC TDA 9818/9817 [7710]
- Sound processor MSP3415G [7600]

Tuner and IF selection
The Tuner [1705] converts the RF-signal coming from the antenna input to an IF-signal. The tuner is fully controlled via I^2C-bus of the CC-µP. [1705] is also equipped with a "passive-loop-through" between antenna-in and -out to save power in stand-by of the set, when the complete part is not supplied. The IF frequency of the video carrier is 38.9 MHz for all systems except SECAM L' (34,0 MHz).
A quasi-split audio system is used. Separate surface-wave filters (SAW) are required. [1701], [1703] for video, [1702] for audio. [1701] is switched into the signal path for DK/I-SECAM L/L' reception, if the signal "SFS_TS" is "high". In this case the switches [7704], [7705] are open and the diode [6703] is conducting. [1703] is switched into the signal path for BG reception ("SFS_TS" is "low"). Then the switch [7712] is open and the diode [6704] is conducting. For DK/I-SECAM L/L' reception, an additional circuit for suppressing the audio carrier of the adjacent channel is used. This circuitry is adjusted by coil [5710] for maximum suppression at 40.4MHz.

IF demodulator
The signal from the tuner and IF-selection circuit is processed by the demodulator IC TDA 9818/9817 [7710]. The signal "PSS" to pin 3 switches between demodulation of positive (SECAM only) or negative modulated video carriers. A QSS-audio-IF signal SIF1 is generated for demodulation in the sound processor [7600]. The audio-IF carrier is selected in the audio SAW filter [1702]. This filter is switched for SECAM L'. If the signal "SB1" is "high", the switch [7714] is closed and the diode [6705] is not conducting. For all other standards the diode [6705] is conducting and the switch [7714] is open. The output signal of this SAW filter is firstly processed in the TDA 9818. Audio carriers are converted from the tuner IF level to the audio IF position and further processed in the audio demodulator [7600]. The AFC coil [5711] on the TDA 9818/9817 is adjusted so that when a frequency of 38.90 MHz is supplied to the IF output of the tuner, the AFC voltage on pin 17 of [7710] is 2.5V. The setting of the picture carrier frequency for SECAM L in the TDA 9818 is achieved by connecting pin 7 of the IC via a resistor [3710] to ground. The switch [7701] and the signal "SB1" do this. The HF-AGC is set using the potentiometer [3724] so that, with a sufficiently large antenna input signal (74 dBµV), the voltage at the IF output of the tuner [1705] pin 11 is 500 mVpp. This setting must be carried out when the audio carrier is switched off. The demodulated video signal appears on pin 16 of [7710]. The AGC voltage at pin 4 is used to determine the antenna signal strength after a buffer [7717] with the signal "AGC" and an analog input port of the CC-P. The trap [1704] reduces the sound carrier remainders in the video for BG standards. The trap [1706] works in the same way for the Pal-I standard only. For all other standards the switch [7713] is closed via [7706] and "SFS_TS"-line set "high" to bypass this trap. In these cases the selectivity of the SAW filter [1701] is sufficient. The coil [5713] for non-BG standards realizes a frequency response correction. This correction is not desired for SECAM L' and therefore short-circuited by [7716] (signal SB1 is "high" and [7702] has on-status). The demodulated video signal "VFV" is available after the buffer and limiting stage for noise peaks [7711]. The FM-PLL demodulator function of TDA 9818 is not necessary and therefore deactivated by the resistor [3739].

Audio demodulator
The sound demodulation is done by the MSP3415 [7600], which is also fully controlled via I^2C-bus by the CC-P (determination of bandwidth, amplitude, standard, ...).The audio signals are available at pin 30 and pin 31 of [7600] and fed as "AFER"- & "AFEL"-line to the audio-I/O for further processing.

9.3.4 Audio routing


Audio IO Europa Overview
11.03.2002 Vers. C
Scart2
Scart1
AudioR
AudinR
AudOutL
AudinL
-2dB
AKILL
OUT1R
OUT1L
OUT2R
OUT2L
0dB
+6dB
HEF4052
POS.7504
POS.7503
POS.7501
MSB/LSB
LL
LH
HL
HH
Logic
MSB
LSB
H
O
L
AIN2R
ARDAC
AIN2L
ALDAC
ASC1S
from IOV
IASC1M
from IOV
VSA1
VSA2
AIN1R
AFER
AIN1L
AFEL
AIN1L
AIN2L
AINFL
AIN1R
AINFR
RSA1
RSA2
Dig.Audio Out
from dig. board
AR
AL
DAC_MUTE
ARADC
ALADC
UDA1360
ADC
PWONSW
A_DATA
to dig. board
MSP34XX
POS.7600
Demodulator
Source select
SC1_OUT_R
SC1_OUT_L
DACM_R
DACM_L
Q.Peak Det
I2C Control
SIF1
DVAL
DVAR
SCL
SDA
Tuner
DVIN
AINFR
AINFL
MUTE
KILL
DKILL
IPFAIL
D_DATA0
ION
UDA1334
DAC
VOR
VOL
D_DATA
from dig. board

TR 01055_001
170502

The processing of audio is always done in stereo (e.g. separate left- and right-channel) and the complete switching is realized by using HEF4052, which is a dual four-to-one multiplexer. In principle there are three independent selectors:

a) Scart 1-Output-Path:

Pos [7504] is used to select either Scart 2-Input ("AIN2L"/ "AIN2R") or the signal directly from the audio DAC [7004] ("ALDAC"/"ARDAC") as the output source for Scart 1 ("AOUT1L"/"AOUT1R").

The control is done by means of the lines "ASC1S" coming from [7408] (IC [7408] acts as a port expander for the CC-P) and "IASC1M", which is directly coming from the CC. Pos [7412] is used for level adaptation (3V3 to 5V) for the "IASC1M"-signal.

b) Scart 2-Output-Path:

Pos [7503] selects between Scart 1-Input ("AIN1L"/"AIN1R"), signals from the internal frontend ("AFEL"/"AFER") via MSP [7600] or audio directly from the DAC [7004] ("ALDAC"/ "ARDAC"). The outputs of this switch are routed to Scart 2 ("AOUT2L"/AOUT2R"). This switch is controlled via "VSA1"- and "VSA2"-line. These lines come from [7408] that is acting as a port expander for the CC-P.

c) Record-Path:

Pos [7501] selects either signals from Scart 1 ("AIN1L"/ "AIN1R") or Scart 2 ("AIN2L"/"AIN2R") or Cinch-Front ("AINFL"/ "AINFR") or the MSP [7600] ("AFEL"/"AFER") and routes to the audio ADC [7007] ("ALADC"/"ARADC") for record purposes. The switch is controlled via "RSA1"- and "RSA2"-signals. These signals come from the MSP [7600], which acts as a port expander of the CC-P. As there can also exist a fifth input in case of DV-In is present the corresponding analog audio signals from the DVIO-board are firstly routed via extra cable and connector [1960] to the MSP. The MSP acts as a preselector between audio from internal frontend or the DV-Input.

Each of these three selectors ([7501], [7503] & [7504]) has a separate Op-Amp on the output for level-adaptation-, performance- and line-driving-reasons. [7505-A & -B] for record, [7502-C & -D] for Scart 1-Output and [7502-A & -B] respectively for Scart 2. Every audio output line on the two Scart connectors can be "killed" (muted) by an extra transistors ([7506], [7508], [7509] &[7511]), which can be activated by the "AKILL"-line. This signal is generated by the circuit around [7404]/[7421] and is a combination of the "KILL"- from the CC-P and the "IPFAIL" of the power-supply-unit.

d) Line-Out-Path:

see chapter 9.3.5

e) Digital Audio Output-Path without IOE-Print:

Additionally to analog audio the set is also equipped with a digital output via cinch plug [1951]. The signal is generated on the dig. board and routed via audio interface cable and connector [1900] to the Ana-PCB. Here the "DAOUT"-line first passes a 6-fold inverter [7580] being used as a driver and for performance reasons (noise reduction, jitter, etc.). Afterwards a transformer [5580] is necessary to achieve the correct level and also to have a floating output with isolated ground before the signal is fed via [3580] to cinch plug [1951]. The capacitor [2580] performs an AC-coupling between connector- and set-ground.

f) Digital Audio Output-Path with IOE-Print:

In case of usage of the IOE-print the digital audio signals (input and output) are directly routed from digital board via interface cable to plug [1920] on the IOE-print. The "DAOUT"-line is splitted into two signals, one for cinch out and one for optical out. The signal to cinch out first passes a 5-fold inverter [7250] being used as a driver and for performance reasons (noise reduction, jitter, etc.). Afterwards a transformer [5250] is necessary to achieve the correct level and also to have a floating output with isolated ground before the signal is fed via [3259] to the cinch plug [1925] (or [1926-B] in case of option "DIGITAL IN"). The capacitors [2256] and [2266] perform an AC-coupling between connector- and set-ground. The second "DAOUT"-signal is fed directly via [3264] to the optical out transmitter [6255].

g) Digital Audio Input-Path with IOE-Print:

There are two possibilities for a digital audio input signal in case of option "DIGITAL IN". One is the signal from the optical receiver [6259], which is routed via [3269] directly to plug [1920]. The second is the signal from the cinch plug [1926-A]. This signal then passes an inverting amplifier [7250-6] and is then routed via [2253] to the plug [1920].

9.3.5 Audio ADC/DAC

a) PCBs with AD1852 [7004]:

The conversion of analog audio signals from the record-selector [7501] in the I/O ("ALADC"- & "ARADC") is done via UDA1361TS [7007]. This IC can process input signals up to 2Vrms by using external resistors [3047], [3053] in series to the input pins. As the level from the DVIO-Board is only 1Vrms a 6dB step can be performed by setting pin 7 of [7007] to 3,3V via [7008] and the "PWONSW"-line controlled by the CC-P to use the whole dynamic range of the ADC. All required clock signals are generated on the dig. board and only the audio data ("A_DAT"-line) are routed from Ana- to Dig.-PCB for further processing.

The transformation of dig. audio back into the analog domain is done by AD1852 [7004]. All necessary clock signals are coming from the dig. board and dig. audio data ("D_DATA0"-line) are converted into analog signals, which are available at pin 17/16 and pin 12/13 of [7004] as symmetrical signals. Afterwards an Op-Amp. [7003] (line driver & converting to unsymmetrical signal, gain = 1), which is also working as low-pass-filter to increase signal performance (noise, distortions,...), is passed. Then both signals ("ALDAC" & "ARDAC") are directly routed to the rear cinch output and also used in the audio-I/O for further processing. The DAC has also a mute possibility, which can be activated by setting pin 23 to 5V via [7001]. This mute is controlled either by the dig. board ("D_IKLL"-line) or the "IPFAIL"-signal from power-supply-unit (in this case it's the combination of "A_KILL" and "IPFAIL").

If the DAC is muted externally via pin 23 or if there are no audio data available (e.g. "D_DATA0"-line zero), the output pins 8 and 22 of the DAC change to high (+ 5V). These two signals are then combined with diode pos. 6006. After decoupling via [7009] the signal "DAC_MUTE" is used as mute signal for the mute transistors [7415], [7416] for cinch rear out.

b) PCBs with UDA1334BTS [7001]:

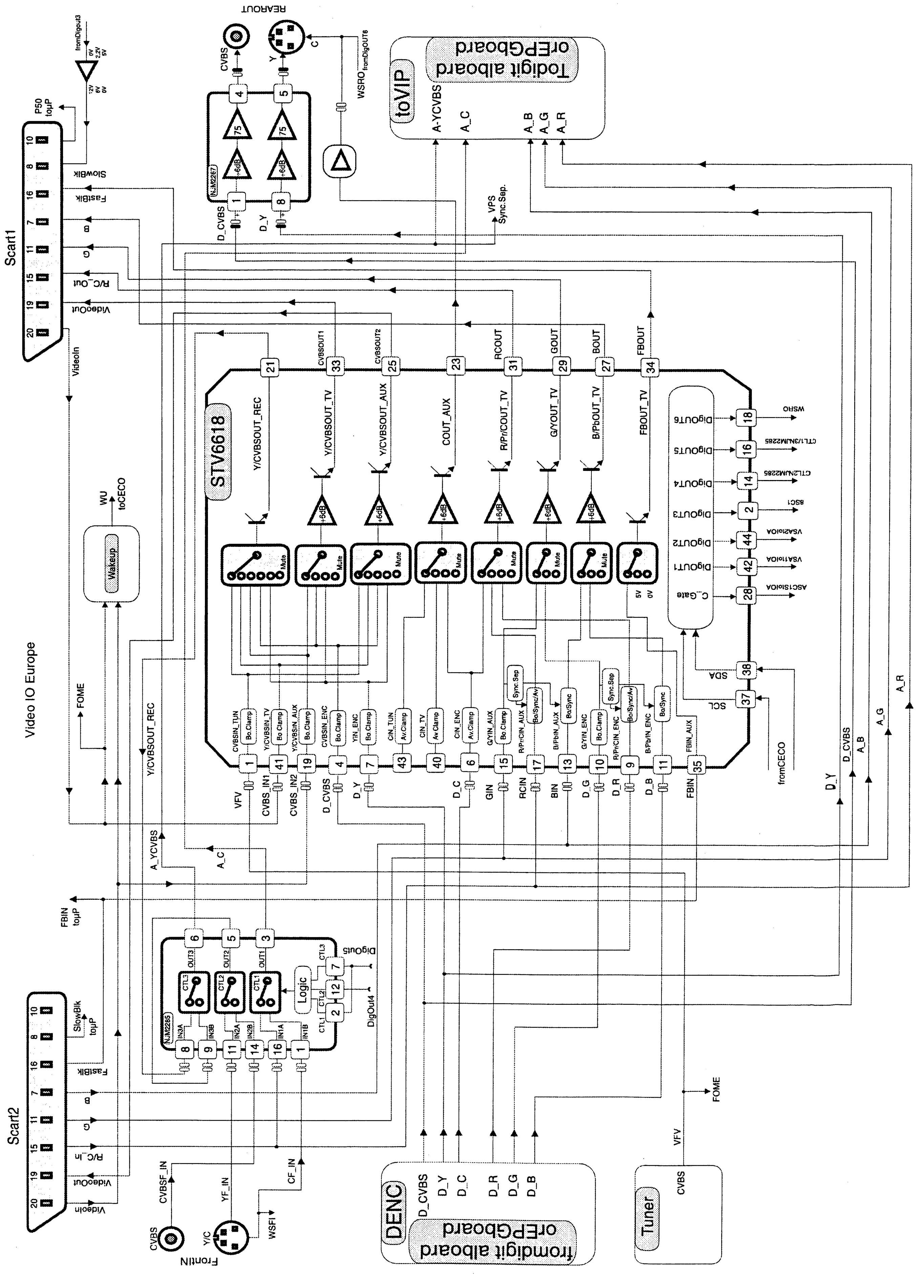
The conversion of analog audio signals from the record-selector [7501] in the I/O ("ALADC"- & "ARADC") is done via UDA1361TS [7005]. This IC can process input signals up to 2Vrms by using external resistors [3039], [3041] in series to the input pins. As the level from the DVIO-Board is only 1Vrms a 6dB step can be performed by setting pin 7 of [7005] to 3,3V via [7006] and the "PWONSW"-line controlled by the CC-P to use the whole dynamic range of the ADC. All required clock signals are generated on the dig. board and only the audio data ("A_DAT"-line) are routed from Ana- to Dig.-PCB for further processing.

The transformation of dig. audio back into the analog domain is done by UDA1334BTS [7001]. All necessary clock signals are coming from the dig. board and dig. audio data ("D_DATA0"-line) are converted into analog signals, which are available at pin 14 and pin 16 of [7001]. Afterwards an Op-Amp. [7002] (line driver & level adaptation, gain = 2) which is also working as low-pass-filter to increase signal performance (noise, distortions,...), is passed. Then both signals ("ALDAC" & "ARDAC") are directly routed to the rear cinch output and also used in the audio-I/O for further processing. The DAC has also a mute possibility, which can be activated by setting pin 8 to 3,3V via [7003]. This mute is controlled either by the dig. board ("D_IKLL"-line) or the "IPFAIL"-signal from power-supply-unit (in this case it's the combination of "A_KILL" and "IPFAIL").

In addition to that the DAC [7001] and the cinch outputs can be killed (muted) in case of "digital silence" by the circuit around [7008], [7009] and [7010], when no audio data are available (e.g. "D_DATA0"-line zero).

This function can be also activated via the "ION"-line (set to high during any stand-by mode). To avoid signal distortions (clipping) the mute transistors for cinch rear out [7415], [7416] are decoupled via [7011].

9.3.6 Video-routing



Scart1
Scart2
Video IO Europe
REAROUT
FrontIN
STV6618
NJM2267
NJM2285
toVIP
Todigit alboard orEPGboard
DENC
fromdigit alboard orEPGboard
Tuner
Wakeup
WU toCECO
P50 touP
FBIN touP
FOME
SlowBlk
FastBlk
R/C_Out
R/C_In
VideoOut
VideoIn
Y/CVBSOUT_REC
A_YCVBS
A_C
A_B
A_G
A_R
A-YCVBS
D_CVBS
D_Y
D_C
D_R
D_G
D_B
CVBS
VFV
VPS Sync.Sep.
WSRO fromDigOUT6
fromDigout3
CVBSF_IN
YF_IN
CF_IN
WSFI
Y/CVBSOUT_REC
Y/CVBSOUT_TV
Y/CVBSOUT_AUX
COUT_AUX
R/Pr/COUT_TV
G/YOUT_TV
B/PbOUT_TV
FBOUT_TV
CVBSOUT1
CVBSOUT2
RCOUT
GOUT
BOUT
FBOUT
CVBSIN_TUN
Y/CVBSIN_TV
Y/CVBSIN_AUX
CVBSIN_ENC
Y/N_ENC
CIN_TUN
CIN_TV
CIN_ENC
G/YIN_AUX
R/Pr/CIN_AUX
B/PbIN_AUX
G/YIN_ENC
R/Pr/CIN_ENC
B/PbIN_ENC
FBIN_AUX
CVBS_IN1
CVBS_IN2
GIN
RCIN
BIN
FBIN
Bo.Clamp
Av.Clamp
Bo/Sync
Sync.Sep
Mute
+6dB
75
DigOUT1
DigOUT2
DigOUT3
DigOUT4
DigOUT5
DigOUT6
C_Gate
ASC1SlotOA
VSA1SlotOA
VSA2SlotOA
8SC1
CTL2NJM2285
CTL1/3NJM2285
WSRO
SDA
SCL
fromCECO
Logic
CTL1
CTL2
CTL3
OUT1
OUT2
OUT3
IN1A
IN1B
IN2A
IN2B
IN3A
IN3B
DigOut4
DigOut5

Figure 9-1

The Video-I/O-switching is basically realized by the matrix switch STV6618 [7408], which is controlled via I^2C-bus by the CC. All used outputs excluding pin 21 (Y/CVBS-REC) have a 6 dB-amplification and a 75 Ohms driver-stage inside. This IC includes also several digital outputs, which are used for switching purposes on the analog board. The record selector inside the switch selects between the CVBS from frontend ("VFV"), the input from Scart 1 ("YCVBSIN1") or the signal from Scart 2 ("YCVBSIN2"). Afterwards the signal passes another switch [7411] in which a selection between signals from the front or the preselected ones are done. The output signals of [7411] are fed as "A_YCVBS"- and "A_C"-line to the digital board for further processing.
To reduce the number of external presets there exists only one preset for CVBS- and Y/C-front. The set automatically detects between the two inputs depending on the presence of a video signal (sync separator-circuit on µP-sub-board) where Y/C has higher priority.
The R/G/B-inputs and the Fast-Blanking-line from Scart 2 are routed over the optional EPG board to the digital PCB. Also all other video signal from the analog board are routed through the EPG board if present. These signals are also available on the corresponding input-pins of the STV6618 to enable a loop-through in AV-Standby. In this mode the set has to behave like a cable between the two Scart-connectors. AV-Standby is activated either by a "high" level on pin 8 of Scart 2 ("active device is present") or by the "WU"-line (wake up). This signal is generated out of the circuit around [7401], [7402] & [7403] and will become "high" if there is a signal on pin 20 of Scart 1- or Scart 2. The detection of the input level on pin 8 of Scart 2 ("8SC2") is done via an analog input of the CC-P (less than 2V means inactive; 4,5V to 7V determines a source with 16:9 picture-ratio and greater than 9,5V is an active 4:3 source).
All signals from the digital board ("D_R", "D_G", "D_B", D_C", "D_Y" and "D_CVBS" are routed to the proper inputs of the STV6618 for amplification and driving purpose before they can be seen on the appropriate Scart outputs. In case of EPG the signals from the digital board are routed through the EPG board where the selection between digital board video or EPG OSD is taken.
The "D_CVBS"- and the "D_Y"-line are passing a 6 dB-amplifier and driver-IC [7410] and are then routed to the CVBS-Cinch and Y/C-out rear. The chroma signal for this Y/C out is coming from the STV6618 - which makes the 6 dB-amplification - and a driver [7406] in between.
The detection of the picture ratio information on the Y/C-input front is made by measuring the DC-level on the Chroma signal via analog input of the CC-P ("WSFI"-line). In case the level is higher than 3,5V the input signal is a 16:9 source. If the level is lower than 2,4V the picture ratio is 4:3.
For generation of the appropriate DC-voltage on the Y/C-out rear the "WSRO"-line is controlled via pin 18 of [7408] by the CC-P (Pin 18 set to low means 4:3, pin 18 set to high determines 16:9).
The control of the switching voltage (Pin 8 of Scart 1) is done via 3-level-pin (nr.2) of the STV6618 [7408] and the transistors [7405], [7407] & [7409]. A "low" on pin 2 of [7408] causes around 11V on pin 8-Scart 1 (e.g. source with 4:3 picture-ratio active). Medium level (2,5V) on pin 2 of the STV6618 generates medium level (approx. 6V) on pin 8-Scart 1 (e.g. active source with 16:9) and a "high" on pin 2 of the STV6618 pushes pin 8-Scart 1 to "low" (e.g. inactive).

9.3.7 VPS/PDC- and Text-Dataslicer

For extraction of relevant information out of the video signal (time controlled recording, net-name-identification, time- & date- download) the STV5348 [7931] is used. Data transfer to/ from the CC is fully done via I^2C-bus and the input signal for decoding is the same as the one being routed to the digital board for recording purposes ("A_YCVBS"-line).

9.3.8 Analog Follow-Me

This circuit compares the video signal from the internal frontend ("VFV") of the recorder with that one of the connected TV-set ("CVBS1"). The TV set delivers the signal via Scart-cable. A comparator [7934] and several additional parts ([7932], [7933], ...) are used to compare the two video signals. In case of both input signals are equal the output-line of this circuit ("FOME") is set to low. Detection is made via an input port of the CC-P.

9.4 Analog board NAFTA- & APAC-Pal- version

9.4.1 Frontend NAFTA

[1701] demodulates the video signal from the antenna input. Tuner and IF-demodulator are in one unit. Also a modulator is included in that part. The audio- and video-signal to the modulator are the ones from the selected input or the playback path of the set ("AMCO"- and "D_CVBS"-line). The control of the tuner is fully done via I^2C-bus by the CC-P. Via the "MSW"-signal and [7701] the modulator is switched on and off. In opposite to this the antenna loop-through is opened or closed. In the APAC-Pal version POS [1700] is used with the difference that it demodulates only PAL- instead of NTSC-signals and has also no modulator. The "CSW_SSW" line switches the modulator between CH3 or CH4 in the NTSC-version.
To achieve optimal tuning the "AFC"-signal is detected by the CC via an analog input; [3701], [3702] and [3703] are used for level adaptation (5V to 3V3). Pos [7700] is a driver for the video signal.
The sound demodulation is realized by the MSP34x5 [7600], which is also fully controlled via I^2C-bus by the CC-P (determination of bandwidth, amplitude, standard, ...). The audio signals are available at pin 30 and pin 31 of [7600] and fed as "AFER"- & "AFEL"-line to the audio-I/O for further processing. As this PCB is used for different regions (NAFTA and APAC) either MSP3425 or MSP3415 are assembled.

9.4.2 Audio routing

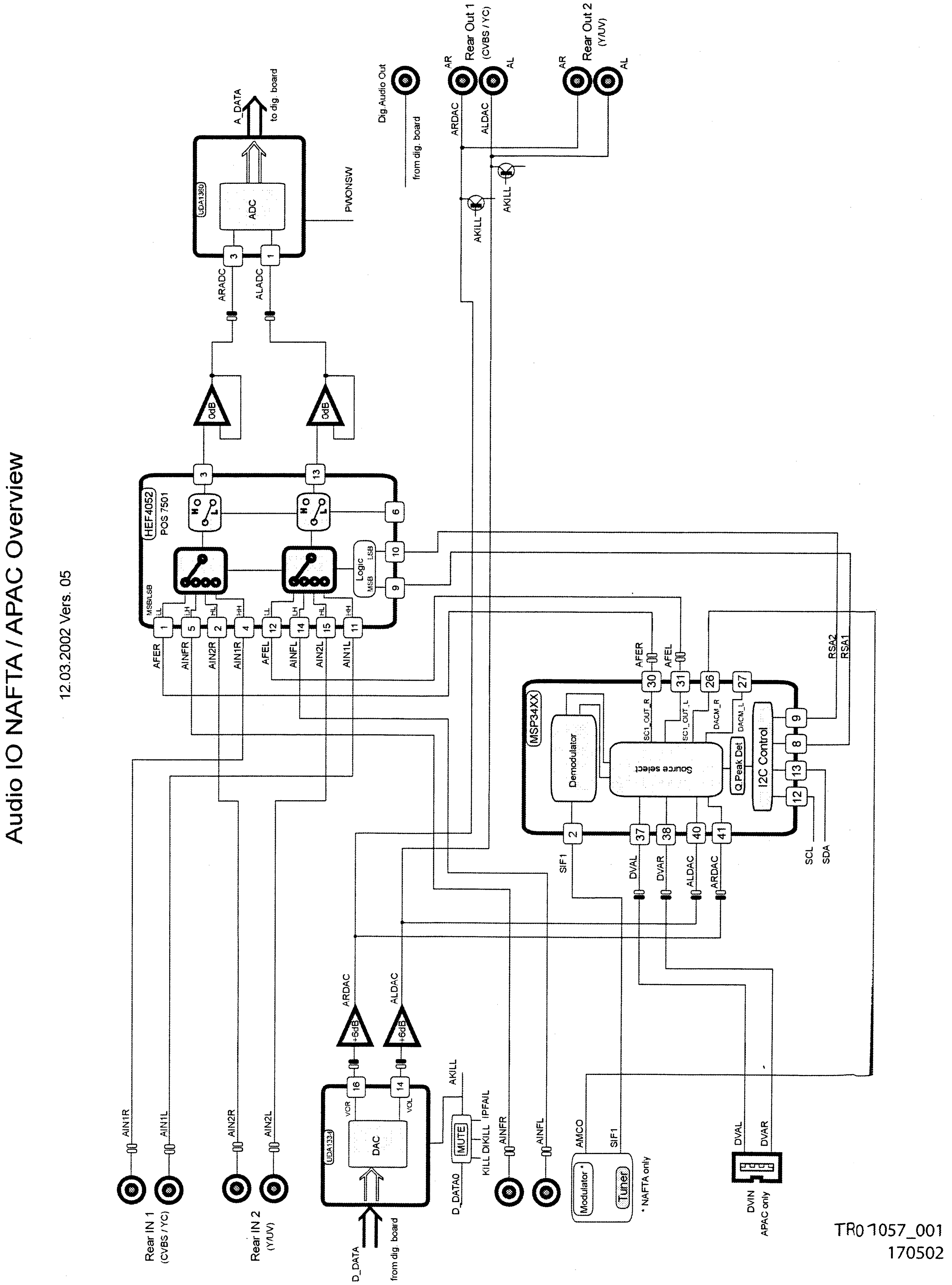

Audio IO NAFTA / APAC Overview
12.03.2002 Vers. 05
A_DATA
to dig. board
UDA1360
ADC
PWONSW
ARADC
ALADC
0dB
0dB
HEF4052
POS 7501
Logic
MSB LSB
MSB/LSB
LL
LH
HL
HH
AFER
AINFR
AIN2R
AIN1R
AFEL
AINFL
AIN2L
AIN1L
Dig.Audio Out
from dig. board
Rear Out 1
(CVBS / YC)
AR
AL
ARDAC
ALDAC
AKILL
Rear Out 2
(Y/UV)
MSP34XX
Demodulator
Source select
Q.Peak Det
I2C Control
SC1_OUT_R
SC1_OUT_L
DACM_R
DACM_L
RSA2
RSA1
SIF1
DVAL
DVAR
SCL
SDA
+6dB
+6dB
UDA1334
DAC
VOR
VOL
D_DATA0
MUTE
KILL DIKILL IPFAIL
D_DATA
from dig. board
Rear IN 1
(CVBS / YC)
Rear IN 2
(Y/UV)
AMCO
Modulator *
Tuner
* NAFTA only
DVIN
APAC only
TR01057_001
170502

Figure 9-2

The sound processing is always done in stereo (that means separate left- and right-channel).

a) Record-Path:

The complete selection of the audio signal for recording is done by a HEF4052 [7501], which is a dual four-to-one multiplexer. The input lines for the selector [7501] are coming either from MSP [7600] ("AFEL"/"AFER") or cinch rear in 1 ("AIN1L"/ "AIN1R") or cinch rear in 2 ("AIN2L"/"AIN2R") or the cinch in front ("AINFL"/AINFR"). The [7501] is controlled via "RSA1"- and "RSA2"-signals coming from the MSP [7600]. The MSP acts as a port expander of the CC-P. The Op-Amp on the output [7504] is necessary for performance reasons and acts also as a driver. The selected signals "ARADC" and "ALADC" are directly fed to the Audio-ADC.

As there can exist also a fifth input in case of DV-In is present the corresponding analog audio signals from the DVIO-board are firstly routed via extra cable and connector [1960] to the MSP, which acts as a preselector between audio from internal frontend or the DV-Input.

b) Line-Out-Path:

see chapter 9.4.3

c) Digital Audio Output-Path without IOE-Print:

Additionally to analog audio the set is also equipped with a digital output via cinch plug [1951]. The signal is generated on the dig. board and routed via audio interface cable and connector [1900] to the Ana-PCB. Here the "DAOUT"-line first passes a 6-fold inverter [7580] being used as a driver and for performance reasons (noise reduction, jitter, etc.). Afterwards a transformer [5580] is necessary to achieve the correct level and also to have a floating output with isolated ground before the signal is fed via [3580] to cinch plug [1951]. The capacitors [2580], [2582] and [2583] perform an AC-coupling between connector- and set-ground.

d) Digital Audio Output-Path with IOE-Print:

see chapter 9.3.4.f

e) Digital Audio Input-Path with IOE-Print:

see chapter 9.3.4.g

9.4.3 Audio ADC/DAC

The conversion of analog audio signals from the record-selector [7501] in the I/O ("ALADC"- & "ARADC") is done via UDA1361TS [7005]. This IC can process input signals up to 2Vrms by using an external resistor [3039], [3041] in series to the input pins. As the level from the DVIO-Board is only 1Vrms a 6dB step can be performed by setting pin 7 of [7005] to 3,3V via [7006] and "PWONSW"-line controlled by the CC-P to use the whole dynamic range of the ADC. All required clock signals are generated on the dig. board and only the audio data ("A_DAT"-line) are routed from Ana- to Dig.-PCB for further processing.

The transformation of dig. audio back to the analog domain is done by UDA1334BTS [7001]. All necessary clock signals are coming from the dig. board and dig. audio data ("D_DATA0"-line) are converted into analog signals, which are available at pin 14 and pin 16 of [7001]. Afterwards an Op-Amp. [7002] (line driver & level adaptation) which also works as a low-pass-filter to increase signal performance (noise, distortions,...) is passed. Then both signals ("ALDAC" & "ARDAC") are directly routed to the rear cinch output. The DAC has also a mute possibility, which can be activated by setting pin 8 to 3,3V via [7003]. This mute is controlled either by the dig. board ("D_IKLL"-line) or the "IPFAIL"-signal from power-supply-unit. In addition to that the DAC [7001] and the cinch outputs can be killed (muted) in case of "digital silence" by the circuit around [7008], [7009] and [7010], when no audio data are available (e.g. "D_DATA0"-line zero).

The signals from the audio DAC part ("ARDAC"/"ALDAC") are directly routed to both cinch rear outputs, which are connected in parallel. To avoid plops and any other audible noise on the output there is a mute-stage implemented [7509], [7511] for each channel. The activation is done via "AKILL"-line, which is a combination of the "KILL" from CC-P, "DAC_MUTE" from DAC-part and "IPFAIL" from the power-supply-unit. The circuit around [6430], [6431], [7430] and [7404] generates this signal.

9.4.4 Video-routing

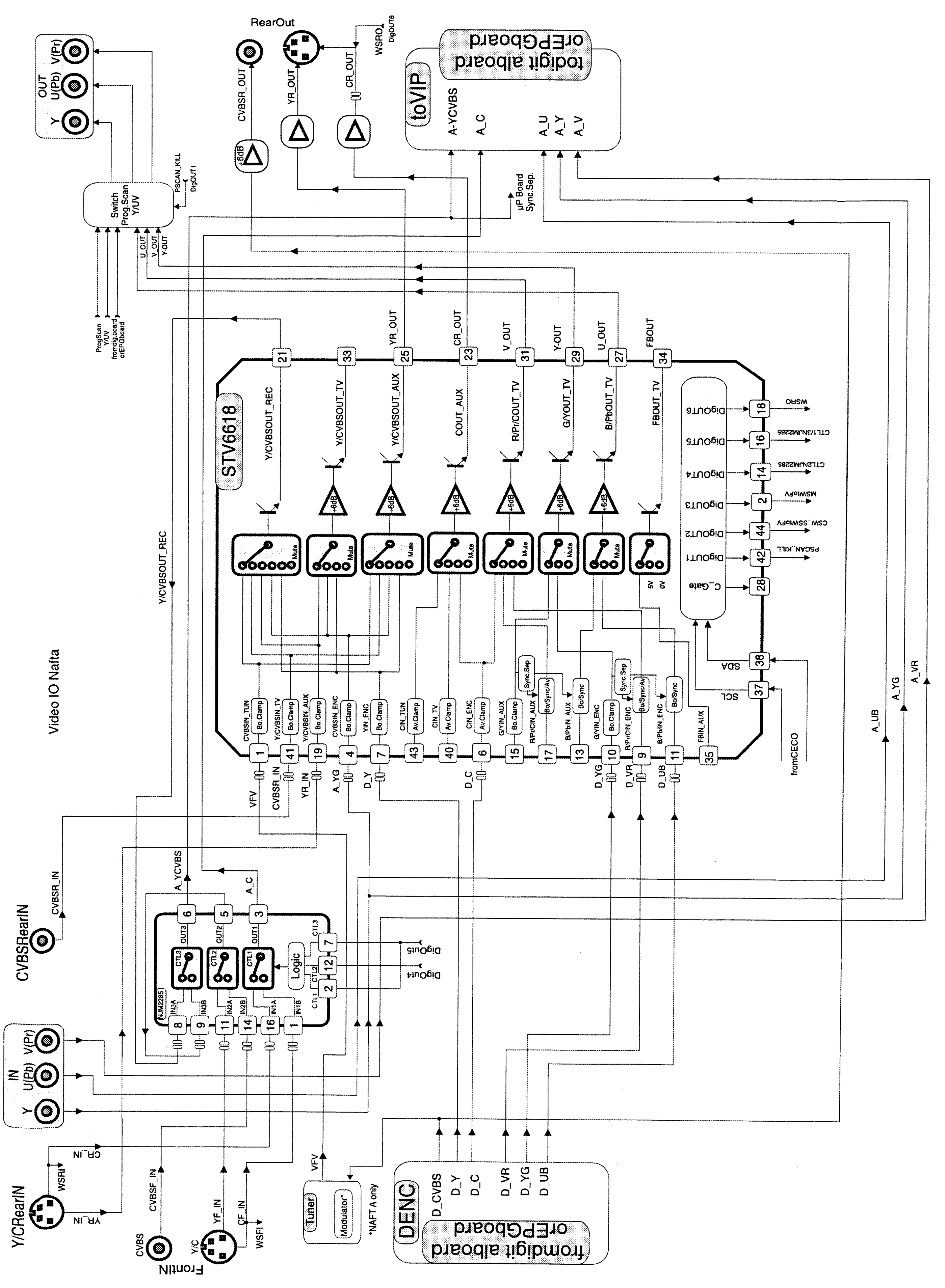

Video IO Nafta
OUT
Y
U(Pb)
V(Pr)
Switch
Prog.Scan
Y/UV
PSCAN_KILL
DigOUT1
U_OUT
V_OUT
Y-OUT
ProgScan
Y/UV
fromdig.board
orEPGboard
RearOut
CVBSR_OUT
+6dB
YR_OUT
CR_OUT
WSRO
DigOUT6
toVIP
todigit alboard
orEPGboard
A-YCVBS
A_C
A_U
A_Y
A_V
µP Board
Sync.Sep.
Y/CVBSOUT_REC
STV6618
21
33
25
23
31
29
27
34
YR_OUT
CR_OUT
V_OUT
Y-OUT
U_OUT
FBOUT
Y/CVBSOUT_REC
Y/CVBSOUT_TV
Y/CVBSOUT_AUX
COUT_AUX
R/Pr/COUT_TV
G/YOUT_TV
B/PbOUT_TV
FBOUT_TV
Mute
DigOUT6
DigOUT5
DigOUT4
DigOUT3
DigOUT2
DigOUT1
C_Gate
18
16
14
2
44
42
28
WSRO
CTL1/3NJM2285
CTL2NJM2285
MSWtoFV
CSW_SSWtoFV
PSCAN_KILL
5V
0V
SDA
SCL
38
37
fromCECO
CVBSIN_TUN
Y/CVBSIN_TV
Y/CVBSIN_AUX
CVBSIN_ENC
YIN_ENC
CIN_TUN
CIN_TV
CIN_ENC
G/YIN_AUX
R/Pr/CIN_AUX
B/PbIN_AUX
G/YIN_ENC
R/Pr/CIN_ENC
B/PbIN_ENC
FBIN_AUX
Bo.Clamp
Av.Clamp
Sync.Sep
Bo/Sync/Av
Bo/Sync
1
41
19
4
7
43
40
6
15
17
13
10
9
11
35
VFV
CVBSR_IN
YR_IN
A_YG
D_Y
D_C
D_YG
D_VR
D_UB
A_UB
A_YG
A_VR
Y/CVBSOUT_REC
CVBSRearIN
CVBSR_IN
A_YCVBS
A_C
6
5
3
OUT3
OUT2
OUT1
CTL3
CTL2
CTL1
Logic
7
12
2
DigOut5
DigOut4
NJM2285
IN3A
IN3B
IN2A
IN2B
IN1A
IN1B
8
9
11
14
16
1
IN
Y
U(Pb)
V(Pr)
Y/CRearIN
WSRI
CR_IN
YR_IN
CVBSF_IN
YF_IN
CF_IN
WSFI
CVBS
Y/C
FrontIN
VFV
Tuner
Modulator*
*NAFTA only
DENC
D_CVBS
D_Y
D_C
D_VR
D_YG
D_UB
fromdigit alboard
orEPGboard

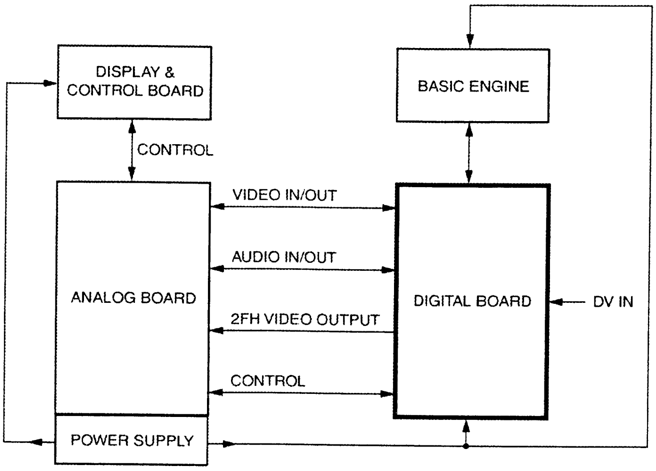
Figure 9-3
]

The Video-I/O-switching is basically realized by the matrix switch STV6618 [7408], which is controlled via I^2C-bus by the CC. All used outputs excluding pin 21 (Y/CVBS-REC) have a 6dB-amplification and a 75 Ohms-driver-stage inside. This IC also includes several digital outputs, which are used for switching purposes on the analog board. The record selector inside the switch selects between the CVBS from frontend, the CVBS from Cinch-Rear or Y from the S-Video-input rear. Afterwards the signal passes another switch [7411] in which a selection between signals from the front or the preselected ones is done. The output signals of [7411] are fed as "A_YCVBS"- and "A_C"-line to the digital board for further processing.
To reduce the number of external presets there is only one station for CVBS or Y/C (front and rear). The set automatically detects between the two inputs depending on the presence of a video signal (sync separator-circuit on µP-sub-board) where Y/C has higher priority.
The Y/U/V-inputs are routed over the optional EPG board to the digital PCB. Only the Y-line has to be present additionally on pin 4 of [7408] for video recognition. Also all other video signal from the analog board are routed through the EPG board if present.
The signals "D_C" and "D_Y" are fed through [7408] (6dB amplification) and via [7406], [7409] used as driver to the S-Video output connector. The "D_CVBS" line is directly routed to the modulator and via the circuit around [7431] and [7432] amplified by 6dB before it is fed to the CVBS output plug. In case of EPG the signals from the digital board are routet through the EPG board where the selection between digital board video or EPG OSD is taken.
The Y/U/V signals from the digital board are also passing [7408] for 6dB amplification and driving purpose.
To achieve optimal picture quality the set is equipped with a simple progressive scan function based on a so-called line doubler. The complete generation of the signal is done on the digital board and via a separate cable and connector [1946] the corresponding Y/U/V lines are routed to the analog PCB. Also the YUVprogressive signals are switchable to EPG OSD on the EPG board if implemented. As there is only one Y/U/V output available a switching between interlaced and progressive output is necessary. While the transistors [7421], [7422], [7424], [7425], [7427] and [7428] are used as driver for Y/U/V progressive, [7423], [7426] and [7429] together with [7405] are necessary for killing these signals via pin 42 of [7408] in case the interlaced is selected ("PSCAN_KILL"-line set to low). If progressive output is active the pins 27, 29 and 31 of [7408] are set to high impedance and "PSCAN_KILL" is also high (e.g. 5V).
The detection of the picture ratio information on the Y/C inputs (rear or front) is done by measuring the DC-level on the Chroma signal via an analog input of the CC-P ("WSRI"- and "WSFI"-line). In case the level is higher than 3,5V the input signal is a 16:9 source, if the level is lower than 2,4V the picture ratio is 4:3.
For generation of the appropriate DC-voltage on the Y/C output the "WSRO"-line is controlled via pin18 of [7408] by the CC-P (Pin 18 set to low means 4:3, pin 18 set to high determines 16:9).
During Stand-By there is also no loop-through of any input to any output performed.

9.5 Digital Board Chrysalis 2.1

9.5.1 Introduction

Block diagram 2nd generation DVD recorder



CL 36532004_001.eps
140203

Figure 9-4

This 2nd generation Digital Board is based on the highly integrated 'Chrysalis' IC. Its predecessors, the 'Empire' and 'Empress' based boards, had two PWBs mounted on top of each other (due to separate DVIO board). For this new generation, all functionality is now available on one PWB in one BGA IC (Ball Grid Array) i.s.o. four VLSI ICs.

The board encodes and multiplexes analogue video and digital uncompressed audio (I2S) into an MPEG2 stream. This MPEG2 stream is formatted, to be recorded by the DVD+RW engine. In playback, the board will decode the MPEG2 stream into analogue and digital audio and into analogue video. In addition, a DV stream can be received via IEEE1394 (i-Link), and transformed to MPEG2 format.

There are versions foreseen, to generate a progressive scan analogue video output. In the standard Chrysalis board, the progressive video output is generated by the PNX7100. In the Chrysalis 'F' it is generated by the Faroudja FLi2301.

The Chrysalis Digital board is pin compatible with the Empress digital board in terms of A/V IO, BE interface, Power Supply, and Service interface. For functional enhancements, several connectors are added:IDE connector (HDD, AV3, PCMCIA, etc.).

9.5.2 Record Mode

Block diagram Chrysalis Digital Board

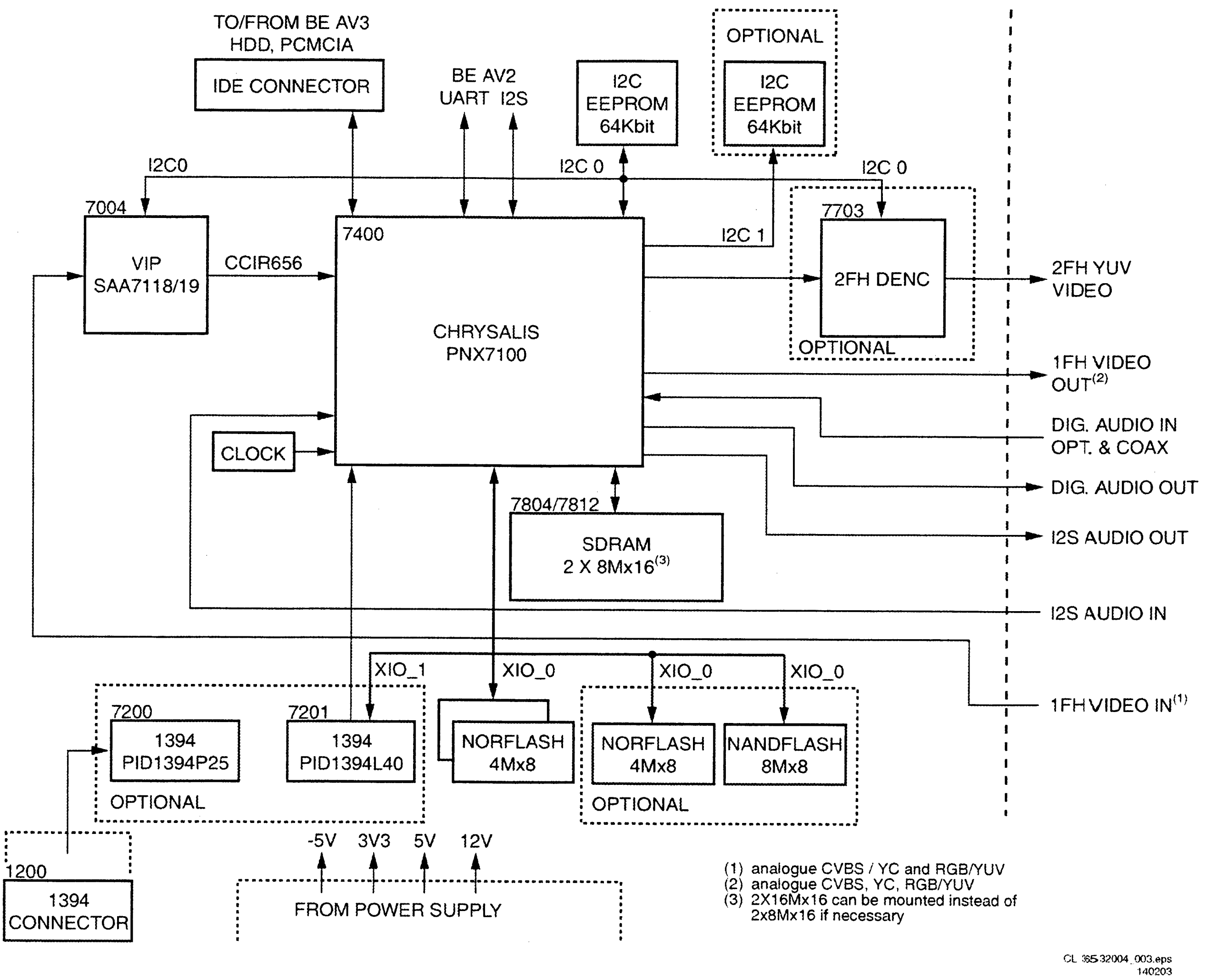

TO/FROM BE AV3
HDD, PCMCIA
IDE CONNECTOR
BE AV2
UART I2S
I2C
EEPROM
64Kbit
OPTIONAL
I2C
EEPROM
64Kbit
I2C0
I2C 0
I2C 0
7004
VIP
SAA7118/19
CCIR656
7400
CHRYSALIS
PNX7100
I2C 1
7703
2FH DENC
OPTIONAL
2FH YUV
VIDEO
1FH VIDEO
OUT(2)
DIG. AUDIO IN
OPT. & COAX
DIG. AUDIO OUT
I2S AUDIO OUT
I2S AUDIO IN
1FH VIDEO IN(1)
CLOCK
7804/7812
SDRAM
2 X 8Mx16(3)
XIO_1
XIO_0
XIO_0
XIO_0
7200
1394
PID1394P25
7201
1394
PID1394L40
OPTIONAL
NORFLASH
4Mx8
NORFLASH
4Mx8
NANDFLASH
8Mx8
OPTIONAL
1200
1394
CONNECTOR
-5V 3V3 5V 12V
FROM POWER SUPPLY
(1) analogue CVBS / YC and RGB/YUV
(2) analogue CVBS, YC, RGB/YUV
(3) 2X16Mx16 can be mounted instead of 2x8Mx16 if necessary
CL 36532004_003.eps
140203

Figure 9-5

Video Part

The analogue video input signals CVBS, YC, and YUV/RGB (RGB for EURO and YUV for USA), are routed via the analogue board to connector 1904 and sent to IC7004 (SAA7118, Video Input Processor).

The digital video input signals are routed from the DV-In connector (item 1200) via ICs 7200 (1394 PHY) and 7201 (1394 LINK) to IC7400 (PNX7100, Chrysalis).

The multistandard Video Input Processor (VIP, IC7400) encodes the analogue video to digital video stream (CCIR656 format). It provides filtering of the analogue signals and separation of luminance and chrominance by a comb filter. The output stream, named ITU_IN(7:0), is then routed to the Chrysalis IC (PNX7100). This IC encodes and decodes the digital video stream into/from MPEG2 format.

Audio Part

I2S audio is sent from the analog board to the Chrysalis IC via connector 1900. The Chrysalis compresses the I2S audio data into an MPEG1-L2/AC3 audio stream.

Front-end I2S

IC7400 (Chrysalis) interfaces directly to the Basic Engine (BE) via connectors 1100 (clock and data) and 1105 (control). For future use (with AV3 BE module, HDD, or card reader) it also interfaces to an IDE bus via connector 1102 .

For detailed information on the AV2 BE module, see Service

It buffers the data streams that are coming from (or going to) these hardware modules.

In the Chrysalis, the video MPEG2 stream and the audio AC3 stream are multiplexed into an I2S stream. The serial data are sent to the Basic Engine for recording.

9.5.3 Playback Mode

During playback, the serial data from the Basic Engine is going directly to the PNX7100 via the serial front-end I2S interface. The PNX7100 is an MPEG CoDec and has the following outputs:

- To the analogue board: analogue video RGB, YC, CVBS on connector 1904.
- I2S audio (PCM format) on connector 1900.
- SPDIF audio (digital audio output) on connector 1904.
- Progressive video on connector 1704.
- Communication gateway (RS232) on connector 1104.

9.5.4 Basic Engine Interfaces

AV2 Basic Engine (VAE8015 and VAE8020)

The UART interface (for the S2B commands) between the Chrysalis and the servo processor (MACE3 on the BE module), controls the AV2 Basic Engine during record and playback mode. For data transport, an I2S bus is used.

Manual 3122 785 12470.

AV3 Basic Engine (VAE8030)
To be prepared for new developments, the Chrysalis Digital Board is equipped with two IDE busses (ATAPI). They can be used for connecting to the new generation Basic Engine (e.g. the AV3), a Hard Disc Drive (HDD), or a Smart Card Reader.

9.5.5 Clock Distribution

Clock distribution on Chrysalis board

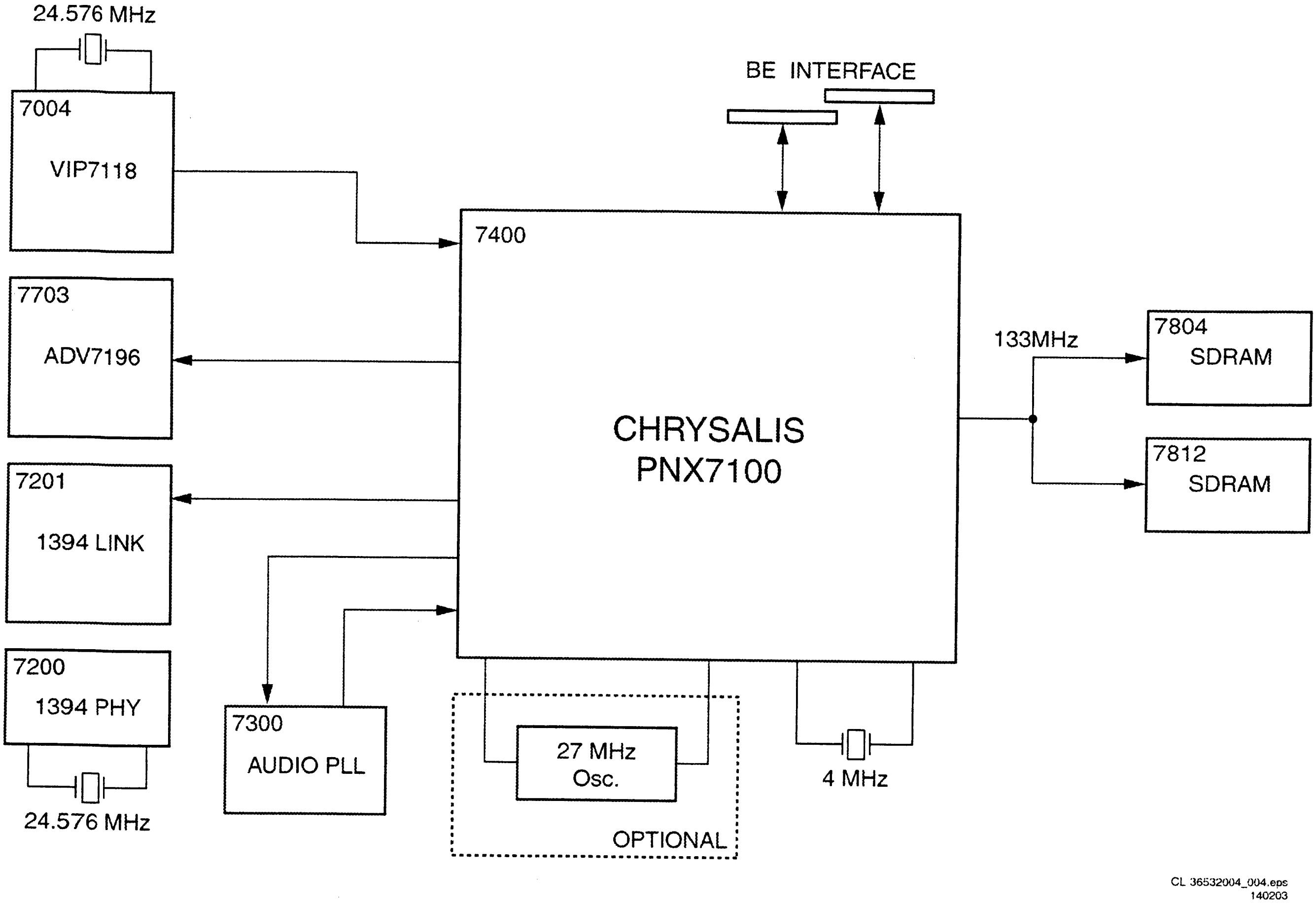


Figure 9-6

The PNX7100 has a complex clock system, which is needed to support the processes running at different frequencies such as video decoding, audio decoding or peripheral I/O devices etc. To ensure a synchronous initialisation of all the registers and state machines, all the PLLs are switched to their default frequency and the reset sequence is run at 4 MHz. Then when the booting control unit is correctly initialized and once it has captured all the booting parameters, it sets the PLLs to its functional frequency to allow the modules to run at their nominal frequencies. Thanks to a clock blocking mechanism, the frequency switching is glitch free.

System clocks:

- PNX7100 (IC7400, pins AF9 and AF10) : 4 MHz provided by the xtal oscillator 7402.
- SAA7118 (IC7004, pins A3 and B4): 24.576 MHz provided by xtal 1001.
- ADV7196 (IC7703, pin 25): 27 MHz provided by PNX7100.
- SDRAM (IC7804 and 7808, pin 38): 133 MHz provided by the PNX7100.
- 1394-LINK (IC7201, pin 88): 49.152 MHz provided by 1394-PHY.
- 1394-PHY (IC7200, pins 59 and 60): 24.576 MHz provided by xtal 1201.

9.5.6 Power Supply

The Digital Board is not powered in standby mode. The control signal 'ION' (Inverse On), coming from the analogue board, will enable the PSU, and power the digital board.

- ION = High: the digital board is in powered down standby mode.
- ION = Low: the power supply to the digital board is enabled.

The 3V3, +5V, -5V, and +12V come from the PSU, while the 1V8 core voltage is generated on the board by a low voltage buck controller (item 7501). It provides the control for a DC-DC power solution producing an 1.8V output voltage over a wide current range. The NCP1570-based solution is powered from 12 V with the output derived from the 3V3 supply. It contains all required circuitry for a synchronous NFET (IC7500-1 and -2) buck regulator.

9.5.7 Memory

Several memories are used on the Chrysalis Digital Board:

- EEPROM IC7810: this memory contains all the necessary boot parameters of the board.
- EEPROM IC7809: this memory contains all the necessary parameters for the application.
- FLASH IC7807(05/11): this memory contains the application-, diagnosis-, and service software.

9.5.8 Reset

Reset concept Chrysalis board

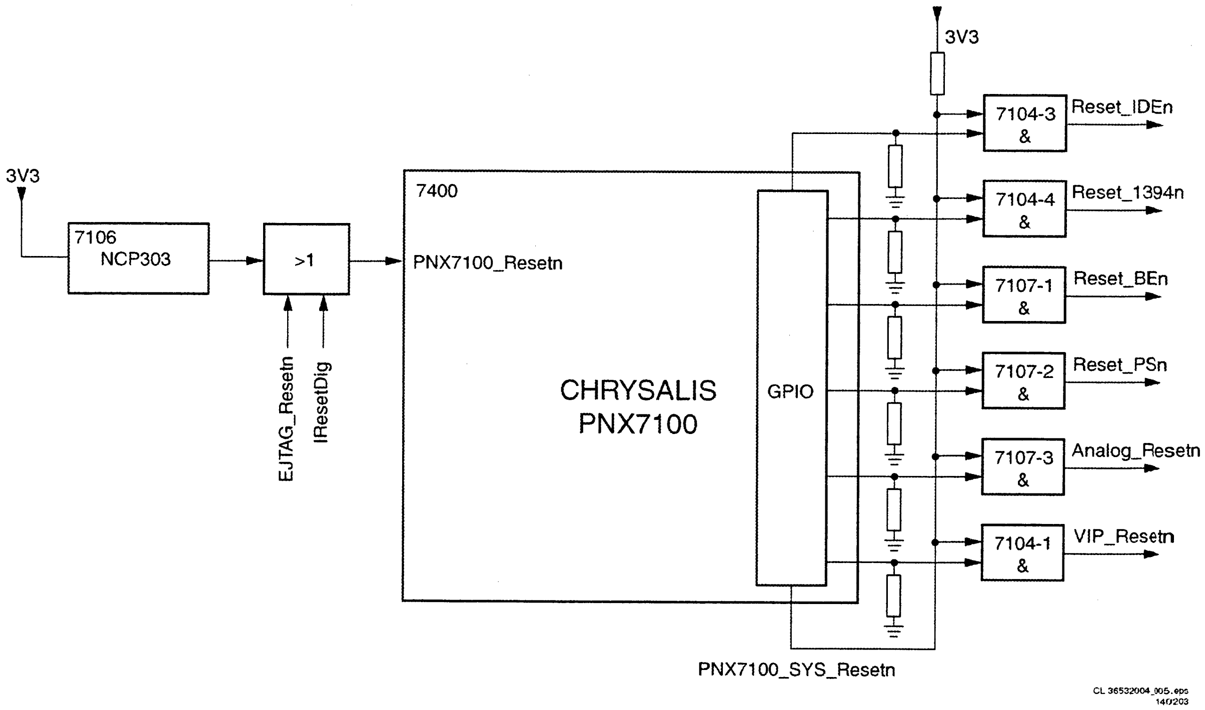


Figure 9-7

The voltage detector NCP303LSN29 (IC7600) provides the reset signal PNX7100_RESETn (active 'low') with the correct timing behavior. This circuitry functions as a Power-On Reset (POR) module, which detects the minimum functional voltage that is needed by the device. It also detects any voltage drop. When the power voltage is outside the nominal range, a reset signal is generated by the POR module and fed to the reset module which controls the individual reset of the different peripherals and processing units.
There are two control lines which can overrule this reset signal:

- IRESET_DIG (controlled by the microprocessor on the Analogue Board).
- EJTAG_RESETn (only for production).

They can pull the output of the NCP303LSN29 (item 7106) down via a shottky diode.
So when the output signal PNX7100_RESETn is 'low', the board will reset. When this signal is 'high', the board is up and running.

The PNX7100_SYS_RESETn is a general enabling signal for the different reset lines. All other reset lines are directly driven from Chrysalis port pins (e.g. MPIO13_IDE1_RESETn). All reset lines are logically connected via 74LVC08D (item 7104) and (item 7107) AND-gates. If both reset signals are low, all other external devices are initialised.

9.5.9 I2C Bus

The PNX7100 is the master of the I2C bus (during reset, external I2C masters are allowed). The following ICs are controlled by the I2C bus:

- IC7809.
- IC7810 NVRAMs.
- IC7004 VIP.
- IC7700 FLI2301 Video De-interlacer Line Doubler (for Chrysalis-F boards).
- IC7703 ADV7196 Video Enc (for progressive scan done by Chrysalis).

9.5.10 I/O Connectors

AIO Connector (item 1900)

The Audio In/Out (AIO) connector is used to interchange digital audio signals between Analog- and Digital Board.

DAIO Connector (item 1901)

The Digital Audio In/Out (DAIO) connector is used to interchange digital audio (SPDIF) signals between the IOE-Board and the Digital Board.

VIO Connector (item 1904)

The Video In/Out (VIO) connector is used to interchange analogue video signals between Analog- and Digital-Board.

9.5.11 Progressive Scan

Introduction

There are two versions foreseen, to generate a progressive scan analogue video output:

- In the standard Chrysalis board, the 'low end' progressive video output is generated by the PNX7100.
- In the Chrysalis 'F', the 'high end' progressive output is generated by the Faroudja FLI2301. This IC offers additionaly DCDi, upscaling to HDTV, and picture enhancement.

Description

The progressive scan part is integrated in the Digital Board and built around the FLI2301 de-interlace/line doubler (7701). This I2C controlled de-interlace uses a 64Mbit SDRAM (32bit x 2M) to perform high quality de-interlacing (meshing). The de-interlace gets its digital YUV input data from the PNX7100 (7400). The format of the digital YUV input to the Fli2301 is CCIR656 with separated Hsync, Vsync, and odd/even signal running on 27MHz.

9.6 Service UART Interface

Logic IC 74HCT14D (item 7111) is used to make a level conversion from microprocessor (LVTTL) to +/-5V (compatible with most RS232 interfaces) and vice versa. The control line MPIO19_CTL_SERVICE is used to activate service and diagnostic SW at start up procedure. The connectivity is provided via an external service tool.

9.7 I/O Extension Board

This board feeds the internal S/PDIF signal from the Digital board to an optical and/or digital out connector. For European players, also an YUV output is present on this board.

9.8 IC Descriptions

9.8.1 Display Board

IC 7103 TMP87CH74F Display Board, Front Microprocessor

Block Diagram

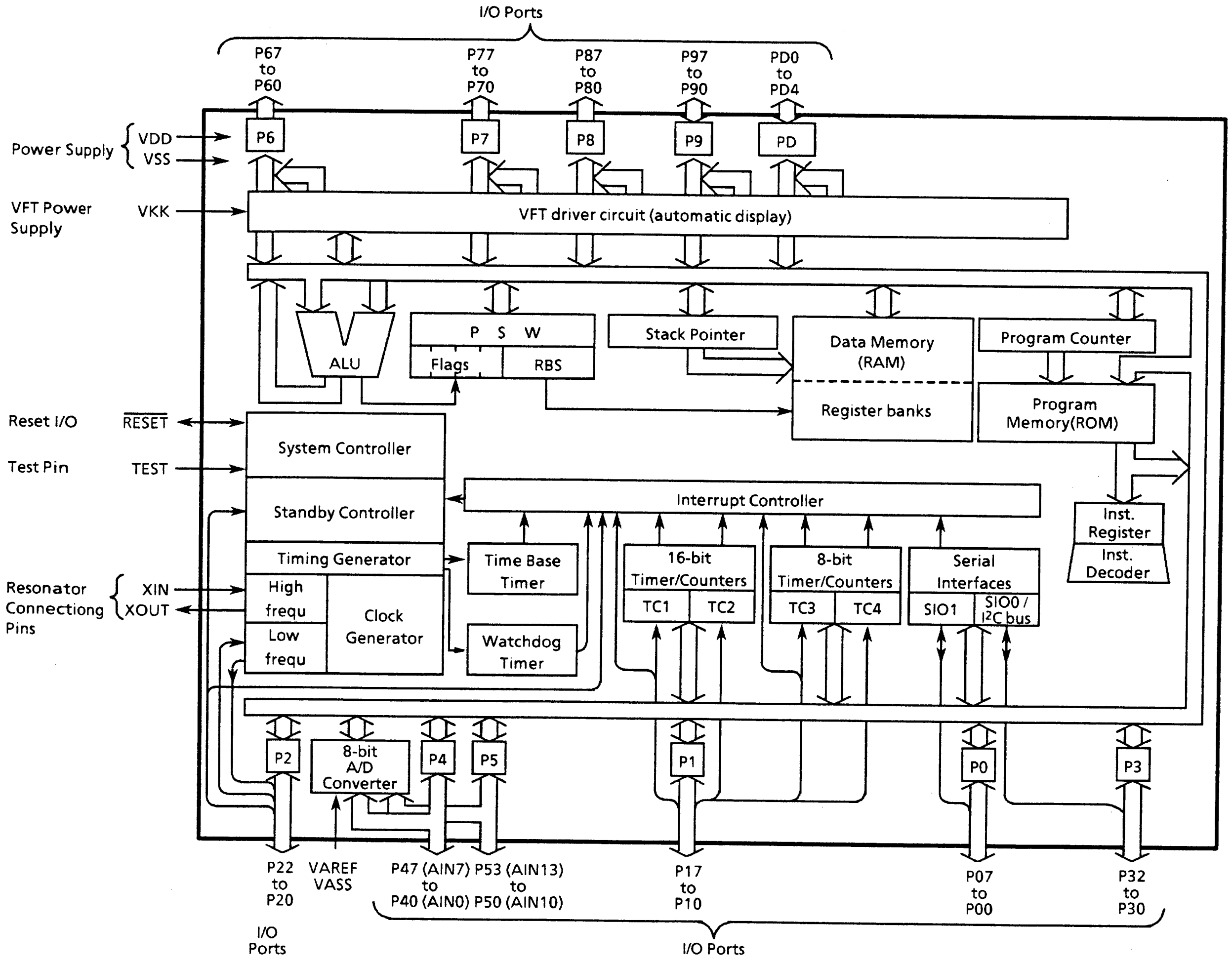

I/O Ports
P67 to P60
P77 to P70
P87 to P80
P97 to P90
PD0 to PD4
Power Supply
VDD
VSS
P6
P7
P8
P9
PD
VFT Power Supply
VKK
VFT driver circuit (automatic display)
ALU
P S W
Flags
RBS
Stack Pointer
Data Memory (RAM)
Register banks
Program Counter
Program Memory(ROM)
Reset I/O
RESET
Test Pin
TEST
System Controller
Standby Controller
Interrupt Controller
Inst. Register
Inst. Decoder
Timing Generator
Time Base Timer
16-bit Timer/Counters
TC1
TC2
8-bit Timer/Counters
TC3
TC4
Serial Interfaces
SIO1
SIO0 / I²C bus
Resonator Connectiong Pins
XIN
XOUT
High frequ
Low frequ
Clock Generator
Watchdog Timer
P2
8-bit A/D Converter
P4
P5
P1
P0
P3
P22 to P20
VAREF VASS
P47 (AIN7) to P40 (AIN0)
P53 (AIN13) to P50 (AIN10)
P17 to P10
P07 to P00
P32 to P30
I/O Ports
I/O Ports

Figure 9-8

Pin Function

Pin Name	Input / Output	Function	
P07 to P03	I/O	Two 8-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. When used as a SIO input/output, an External interrupt input, a timer/counter input, the latch must be set to "0". When used as a PPG output or divider output, the latch must be set to "1".	
P02 (SO1)	I/O (Output)		SIO1 serial data Output
P01 (SI1)	I/O (Input)		SIO1 serial data Input
P00 ($\overline{SCK1}$)	I/O (I/O)		SIO1 serial clock input/output
P17 (INT4/TC3)	I/O (Input)		External interrupt input 4 or Timer/Counter 3 input
P16 (INT2)			External interrupt input 2
P15 (INT3/TC1)			External interrupt input 3 or Timer/Counter 1 input
P14 (TC4/$\overline{PDO}$/$\overline{PWM}$)	I/O (I/O)		Timer counter 4 input or 8-bit programmable divider output or 8-bit PWM output
P13 ($\overline{DVO}$)	I/O (Output)		Divider output
P12 (TC2/$\overline{PPG}$)	I/O (I/O)		Timer counter 2 input or Programmable pulse generator output
P11 (INT1)	I/O (Input)		External interrupt input 1
P10 ($\overline{INT0}$)			External interrupt input 0
P22 (XTOUT)	I/O (Output)	3-bit input/output port with latch. When used as input port, or external interrupt input, STOP mode release signal input, the latch must be set to "1".	Resonator connecting pins (32.768 kHz). For inputting external clock, XTIN is used and XTOUT is opened.
P21 (XTIN)	I/O (Input)		
P20 ($\overline{INT5}$/$\overline{STOP}$)			External interrupt input 5 or STOP mode release signal input
P32 ($\overline{SCK0}$)	I/O (I/O)	3-bit programmable input/output ports (Sink open drain). Each bit of these ports can be individually configured as an input or an output under software control. When used as a I^2C input/output, the latch must be set to "1".	SIO0 serial clock input/output
P31 (SDA/SO0)	I/O (I/O/Output)		I^2Cbus serial data input/output or SIO0 serial data output
P30 (SCL/SI0)	I/O (I/O/Input)		I^2Cbus serial clock input/output or SIO0 serial data Input
P47 (AIN7) to P40 (AIN0)	I/O (Input)	8-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. When used as a analog input, the P4CR must be set to "0".	A/D converter analog inputs
P53 (AIN13) to P50 (AIN10)	I/O (Input)	4-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. When used as a analog input, the P5CR must be set to "0".	A/D converter analog inputs
P67 (V7) to P60 (V0)	I/O (Output)	Four 8-bit high brackdown voltage output ports with the latch. When used as a VFT driver output, the latch must be cleared to "0".	VFT driver outputs
P77 (V15) to P70 (V8)			
P87 (V23) to P80 (V16)			
P97 (V31) to P90 (V24)			
PD4 (V36) toPD0 (V32)	I/O (Output)	5-bit high breakdown voltage output ports with the latch. When used as a VFT driver output, the latch must be cleared to "0".	

Figure 9-9

Pin Name	Input / Output	Function
XIN, XOUT	Input, Output	Resonator connecting pins for high-frequency clock. For inputting external clock, XIN is used and XOUT is opened.
$\overline{\text{RESET}}$	I/O	Reset signal input or watchdog timer output/address-trap-reset output/system-clock-reset outputted.
TEST	Input	Test pin for out-going test. Be tied to low.
VDD, VSS	Power Supply	+ 5 V, 0 V (GND)
VKK		VFT driver power supply
VAREF, VASS		Analog reference voltage inputs (High, Low)

Figure 9-10

9.8.2 IC's Analog Board

IC7408: STV6618 Analog Board, Video Switch Matrix

1.2 Pin Description

Pin No.	Symbol	Description
1	Y/CVBSIN_TUN	Y/CVBS Input from Tuner
2	DIGOUT3	Digital Output Pin 3
3	GND1	Ground Supply 1 for Video Inputs
4	CVBSIN_ENC	CVBS Input from Encoder
5	DECV	Video decoupling capacitor
6	CIN_ENC	Chroma Input from Encoder
7	YIN_ENC	Y Input from Encoder
8	V_{CC}	+5 V Power Supply for Video Inputs
9	R/PR/CIN_ENC	Red or Pr or Chroma Input from Encoder
10	G/YIN_ENC	Green or Y Input from Encoder
11	B/PBIN_ENC	Blue or Pb Input from Encoder
12	GND2	Ground Supply 2 for Video Inputs
13	B/PBIN_AUX	Blue or Pb Input from Auxiliary (SCART2 or external Cinch)
14	DIGOUT4	Digital Output Pin 4
15	G/YIN_AUX	Green or Y Input from Auxiliary (SCART2 or external Cinch)
16	DIGOUT5	Digital Output Pin 5
17	R/PR/CIN_AUX	Red or Pr or Chroma input from Auxiliary (SCART2 or external Cinch)
18	DIGOUT6	Digital Output Pin 6
19	Y/CVBSIN_AUX	Y/CVBS Input from Auxiliary (SCART2 or external Cinch)
20	VCCB_REC	Video Output Recorder Buffer Supply Pin
21	Y/CVBSOUT_REC	Y/CVBS Output to Recorder
22	GNDB_REC	Ground Supply for Recorder Buffer
23	COUT_AUX	Chroma Output to Auxiliary (SCART2 or external Cinch)
24	VCCB1	Video Output Buffer Supply Pin
25	Y/CVBSOUT_AUX	Y/CVBS Output to Auxiliary (SCART2 or external Cinch)
26	GNDB	Ground Supply for Video Buffer
27	B/PBOUT_TV	Blue or Pb Output to TV (SCART1 or external Cinch)
28	C_GATE	External Transistor Command for Bidirectinnal B/C SCART I/O
29	G/YOUT_TV	Green or Y Output to TV (SCART1 or external Cinch)
30	VCCB2	Video Buffer
31	R/PR/COUT_TV	Red or Pr or Chroma Output to TV (SCART1 or external Cinch)
32	VCCB3	Video Output Buffer Supply Pin
33	Y/CVBSOUT_TV	Y/CVBS Output to TV (SCART1 or external Cinch)
34	FBOUT_TV	Fast Blanking Output to TV (SCART1)
35	FBIN_AUX	Fast Blanking Input from Auxiliary (SCART2)

Pin No.	Symbol	Description
36	VDD	+5 V Digital Power Supply
37	SCL	I²C Bus Clock
38	SDA	I²C Bus Data
39	GNDD	Digital Ground Supply
40	CIN_TV	Chroma Input from TV (SCART1 or external Cinch)
41	Y/CVBSIN_TV	Y/CVBS Input from TV (SCART1 or external Cinch)
42	DIGOUT1	Digital Output Pin 1
43	CIN_TUN	Chroma Input from Tuner
44	DIGOUT2	Digital Output Pin 2

Figure 2: STV6618 Input/Output Diagram

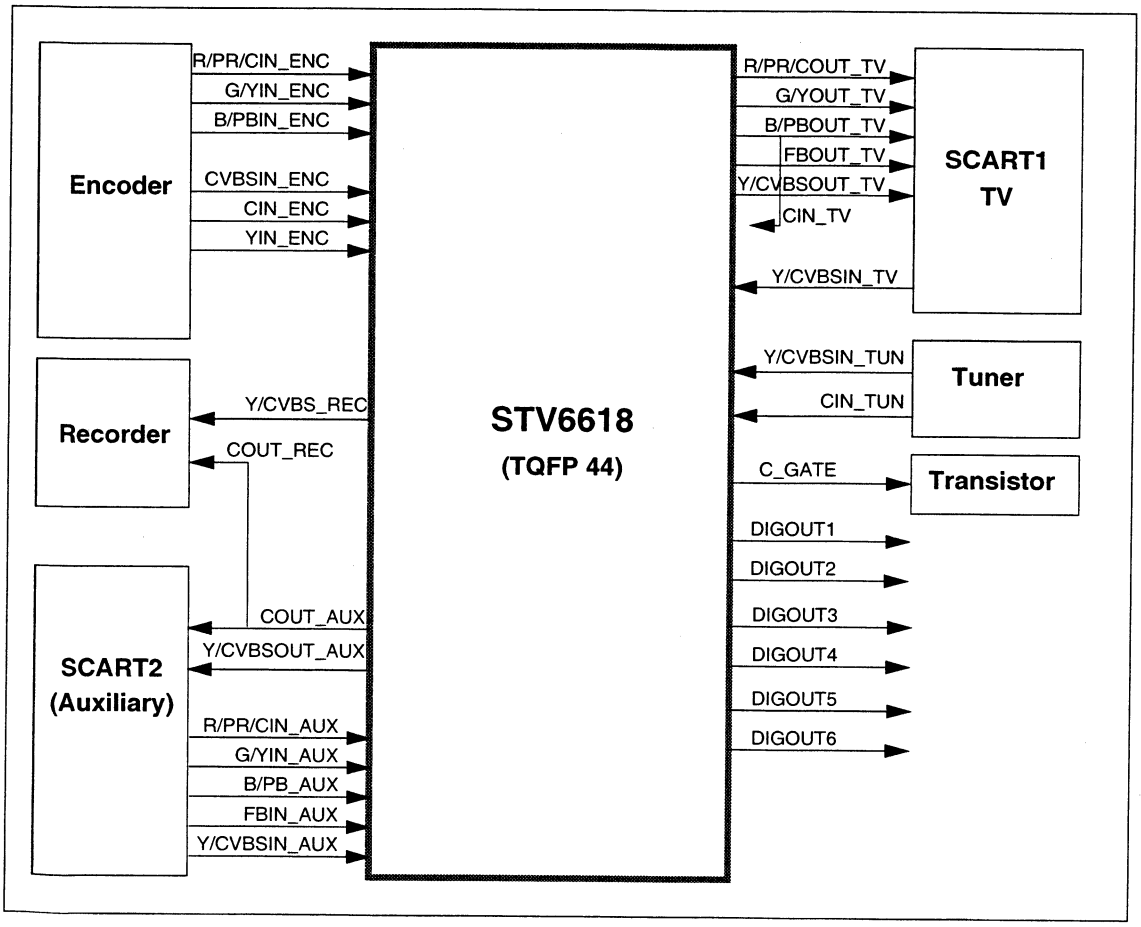
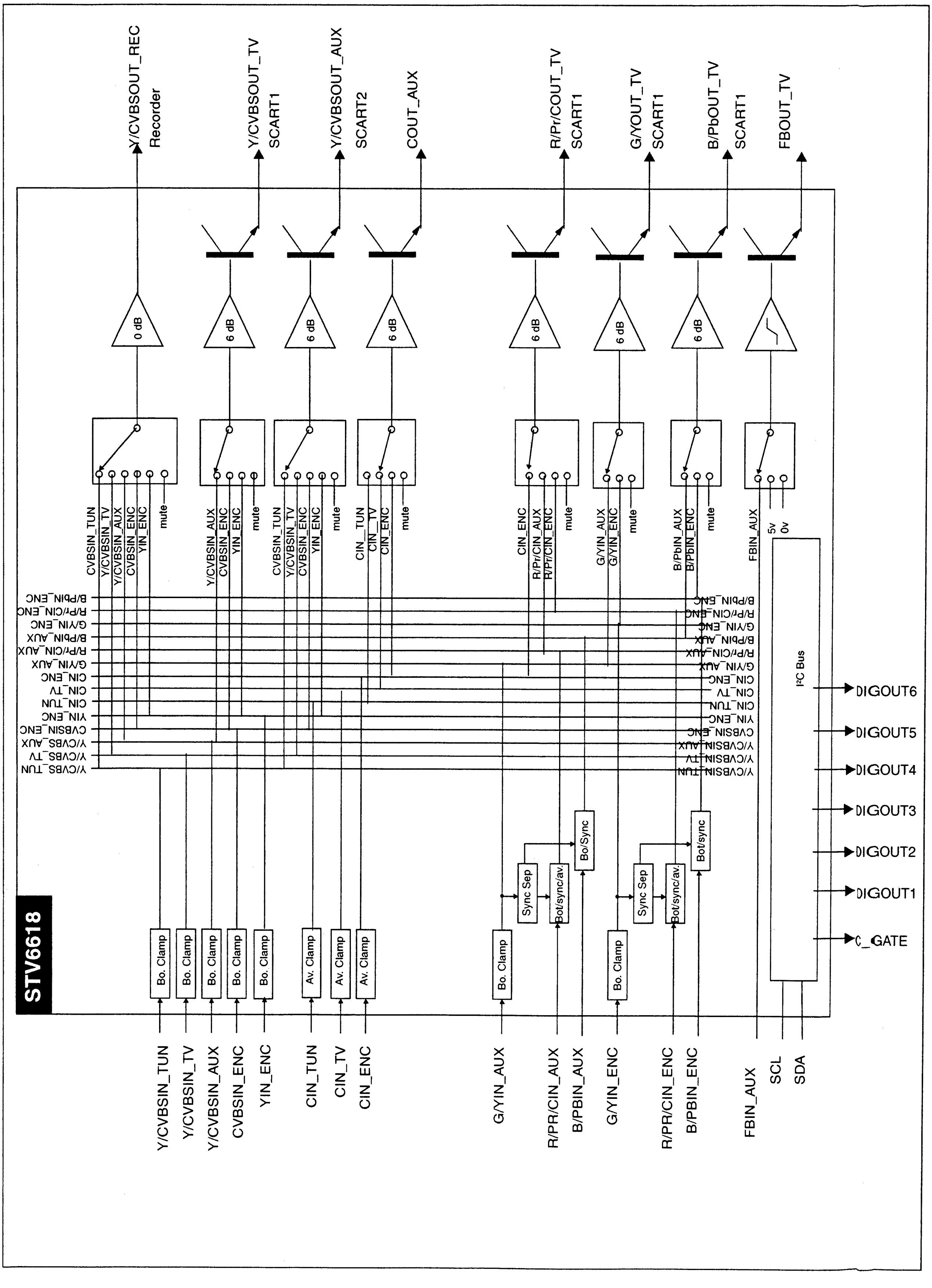
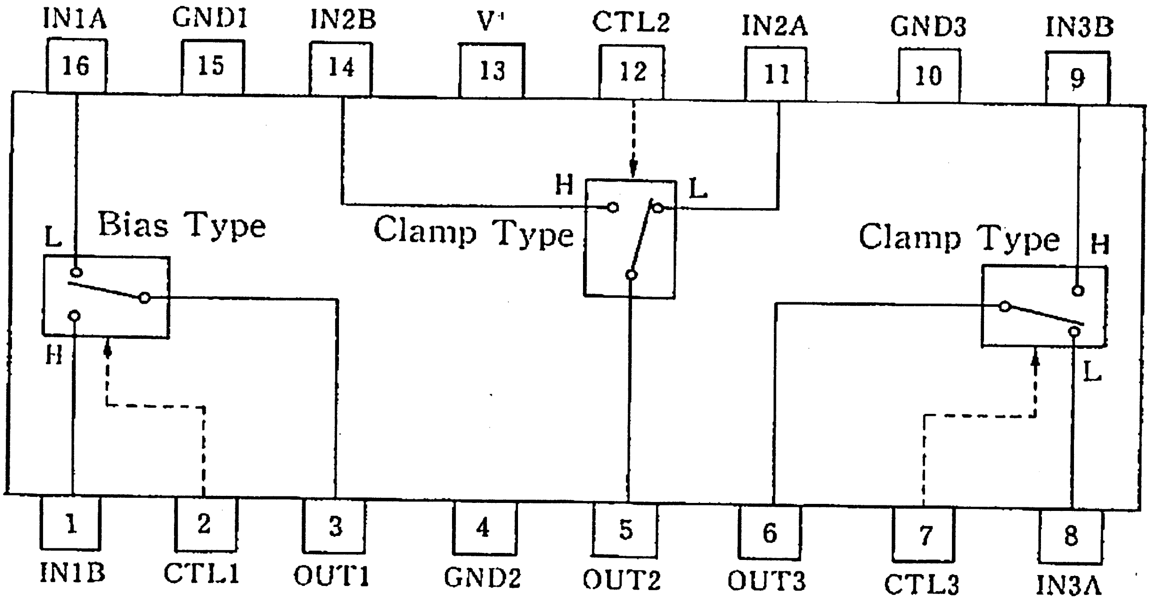

Encoder
R/PR/CIN_ENC
G/YIN_ENC
B/PBIN_ENC
CVBSIN_ENC
CIN_ENC
YIN_ENC
Recorder
Y/CVBS_REC
COUT_REC
SCART2 (Auxiliary)
COUT_AUX
Y/CVBSOUT_AUX
R/PR/CIN_AUX
G/YIN_AUX
B/PB_AUX
FBIN_AUX
Y/CVBSIN_AUX
STV6618
(TQFP 44)
R/PR/COUT_TV
G/YOUT_TV
B/PBOUT_TV
FBOUT_TV
Y/CVBSOUT_TV
CIN_TV
Y/CVBSIN_TV
SCART1 TV
Y/CVBSIN_TUN
CIN_TUN
Tuner
C_GATE
Transistor
DIGOUT1
DIGOUT2
DIGOUT3
DIGOUT4
DIGOUT5
DIGOUT6

Figure 3: STV6618 Block Diagram


STV6618
Y/CVBSOUT_REC
Recorder
Y/CVBSOUT_TV
SCART1
Y/CVBSOUT_AUX
SCART2
COUT_AUX
R/Pr/COUT_TV
SCART1
G/YOUT_TV
SCART1
B/PbOUT_TV
SCART1
FBOUT_TV
0 dB
6 dB
6 dB
6 dB
6 dB
6 dB
6 dB
CVBSIN_TUN
Y/CVBSIN_TV
Y/CVBSIN_AUX
CVBSIN_ENC
YIN_ENC
mute
Y/CVBSIN_AUX
CVBSIN_ENC
YIN_ENC
mute
CVBSIN_TUN
Y/CVBSIN_TV
CVBSIN_ENC
YIN_ENC
mute
CIN_TUN
CIN_TV
CIN_ENC
mute
CIN_ENC
R/Pr/CIN_AUX
R/Pr/CIN_ENC
mute
G/YIN_AUX
G/YIN_ENC
mute
B/PbIN_AUX
B/PbIN_ENC
mute
FBIN_AUX
5v
0v
B/PbIN_ENC
R/Pr/CIN_ENC
G/YIN_ENC
B/PbIN_AUX
R/Pr/CIN_AUX
G/YIN_AUX
CIN_ENC
CIN_TV
CIN_TUN
YIN_ENC
CVBSIN_ENC
Y/CVBS_AUX
Y/CVBS_TV
Y/CVBS_TUN
I²C Bus
DIGOUT6
DIGOUT5
DIGOUT4
DIGOUT3
DIGOUT2
DIGOUT1
C_GATE
Bo. Clamp
Av. Clamp
Sync Sep
Bot/sync/av.
Bo/Sync
Bot/sync
Y/CVBSIN_TUN
Y/CVBSIN_TV
Y/CVBSIN_AUX
CVBSIN_ENC
YIN_ENC
CIN_TUN
CIN_TV
CIN_ENC
G/YIN_AUX
R/PR/CIN_AUX
B/PBIN_AUX
G/YIN_ENC
R/PR/CIN_ENC
B/PBIN_ENC
FBIN_AUX
SCL
SDA

IC7411: NJM2285 Analog Board, Video Switch


IN1A
GND1
IN2B
V+
CTL2
IN2A
GND3
IN3B
16
15
14
13
12
11
10
9
H
L
L
Bias Type
Clamp Type
Clamp Type
H
H
L
1
2
3
4
5
6
7
8
IN1B
CTL1
OUT1
GND2
OUT2
OUT3
CTL3
IN3A

NJM2285D
NJM2285M
NJM2285V

IC7313 TEA 1507 Analog Board, Power Supply Control

BLOCK DIAGRAM

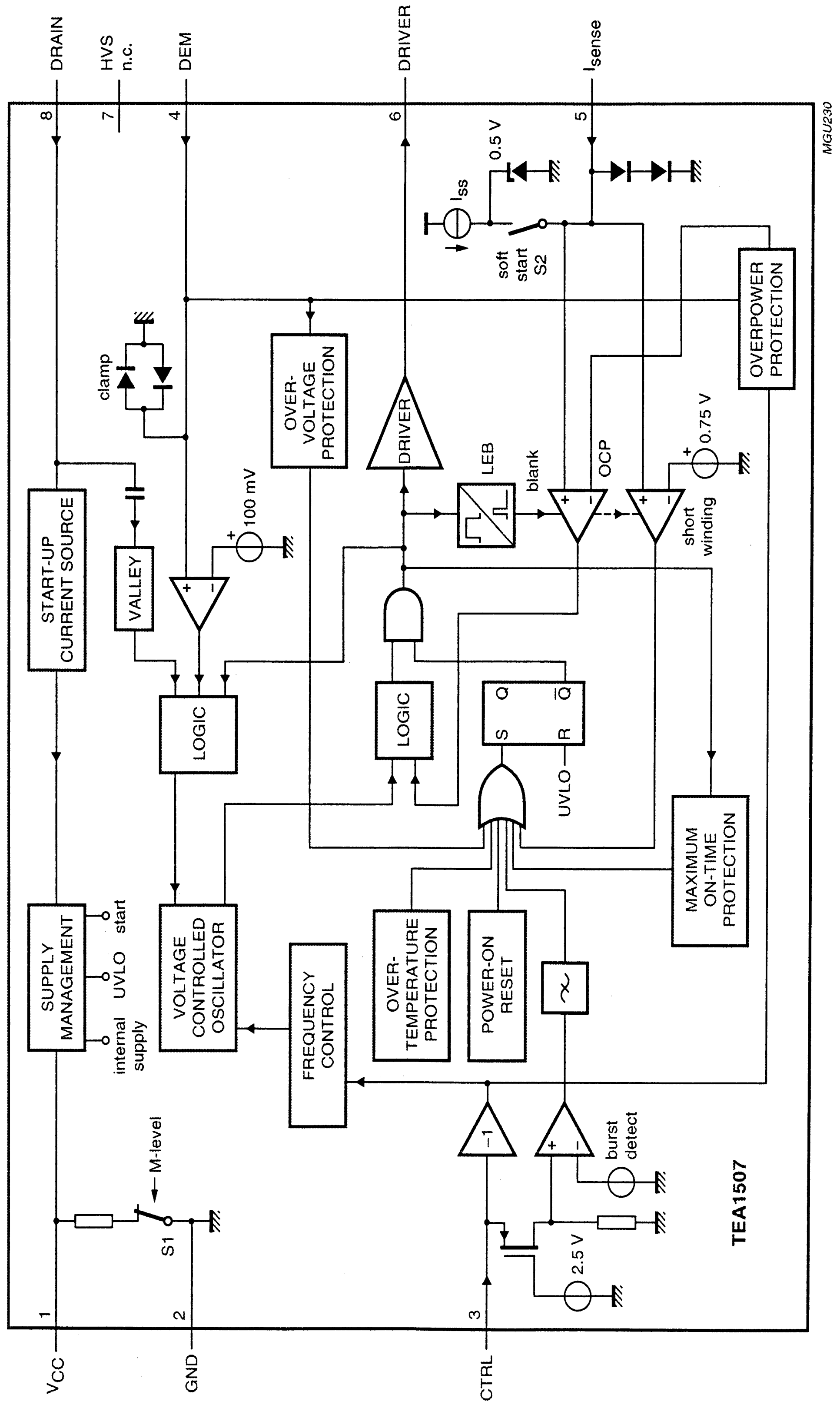
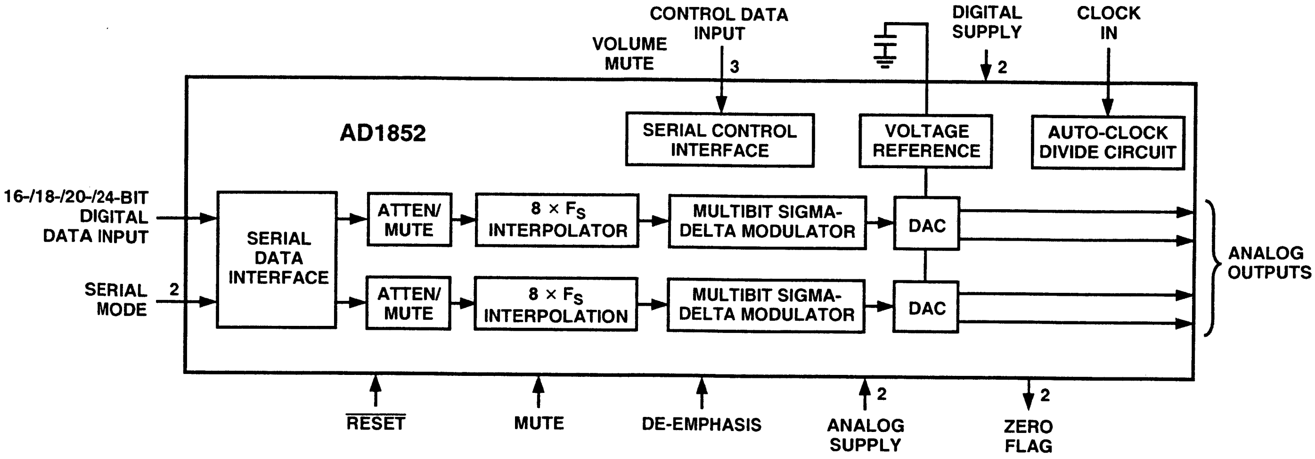

DRAIN
HVS
n.c.
DEM
DRIVER
Isense
8
7
4
6
5
MGU230
0.5 V
Iss
soft
start
S2
clamp
OVER-
VOLTAGE
PROTECTION
OVERPOWER
PROTECTION
DRIVER
LEB
blank
OCP
0.75 V
short
winding
START-UP
CURRENT SOURCE
VALLEY
100 mV
LOGIC
LOGIC
S
Q
R
Q̄
UVLO
MAXIMUM
ON-TIME
PROTECTION
SUPPLY
MANAGEMENT
internal
supply
UVLO
start
VOLTAGE
CONTROLLED
OSCILLATOR
FREQUENCY
CONTROL
OVER-
TEMPERATURE
PROTECTION
POWER-ON
RESET
burst
detect
−1
M-level
S1
2.5 V
TEA1507
1
2
3
VCC
GND
CTRL

Fig.2 Block diagram.

IC7404: AD1582 Analog Board, Digital/Analogue Converter

FUNCTIONAL BLOCK DIAGRAM


CONTROL DATA INPUT
VOLUME
MUTE
3
DIGITAL SUPPLY
2
CLOCK IN
AD1852
SERIAL CONTROL INTERFACE
VOLTAGE REFERENCE
AUTO-CLOCK DIVIDE CIRCUIT
16-/18-/20-/24-BIT DIGITAL DATA INPUT
SERIAL MODE
2
SERIAL DATA INTERFACE
ATTEN/ MUTE
8 × F_S INTERPOLATOR
MULTIBIT SIGMA-DELTA MODULATOR
DAC
ATTEN/ MUTE
8 × F_S INTERPOLATION
MULTIBIT SIGMA-DELTA MODULATOR
DAC
ANALOG OUTPUTS
RESET
MUTE
DE-EMPHASIS
ANALOG SUPPLY
2
ZERO FLAG
2

AD1852

PIN FUNCTION DESCRIPTIONS

Pin	Input/Output	Pin Name	Description
1	I	DGND	Digital Ground.
2	I	MCLK	Master Clock Input. Connect to an external clock source at either 256 F_S, 384 F_S, 512 F_S, 768 F_S, or 1024 F_S.
3	I	CLATCH	Latch Input for Control Data. This input is rising-edge sensitive.
4	I	CCLK	Control Clock Input for Control Data. Control input data must be valid on the rising edge of CCLK. CCLK may be continuous or gated.
5	I	CDATA	Serial Control Input, MSB first, containing 16 bits of unsigned data per channel. Used for specifying channel-specific attenuation and mute.
6		NC	No Connect.
7	I	192/$\overline{48}$	Selects 48 kHz (LO) or 192 kHz Sample Frequency.
8	O	ZEROR	Right Channel Zero Flag Output. This pin goes HI when Right Channel has no signal input for more than 1024 LR Clock Cycles.
9	I	DEEMP	De-Emphasis. Digital de-emphasis is enabled when this input signal is HI. This is used to impose a 50 µs/15 µs response characteristic on the output audio spectrum at an assumed 44.1 kHz sample rate. Curves for 32 kHz and 48 kHz sample rates may be selected via SPI control register.
10	I	96/$\overline{48}$	Selects 48 kHz (LO) or 96 kHz Sample Frequency.
11, 15	I	AGND	Analog Ground.
12	O	OUTR+	Right Channel Positive Line Level Analog Output.
13	O	OUTR–	Right Channel Negative Line Level Analog Output.
14	O	FILTR	Voltage Reference Filter Capacitor Connection. Bypass and decouple the voltage reference with parallel 10 µF and 0.1 µF capacitors to the AGND.
16	O	OUTL–	Left Channel Negative Line Level Analog Output.
17	O	OUTL+	Left Channel Positive Line Level Analog Output.
18	I	AVDD	Analog Power Supply. Connect to Analog 5 V Supply.
19		FILTB	Filter Capacitor Connection. Connect 10 µF capacitor to AGND (Pin 15).
20	I	IDPM1	Input Serial Data Port Mode Control One. With IDPM0, defines 1 of 4 serial modes.
21	I	IDPM0	Input Serial Data Port Mode Control Zero. With IDPM1, defines 1 of 4 serial modes.
22	O	ZEROL	Left Channel Zero Flag Output. This pin goes HI when Left Channel has no signal input for more than 1024 LR Clock Cycles.
23	I	MUTE	Mute. Assert HI to mute both stereo analog outputs. Deassert LO for normal operation.
24	I	$\overline{\text{RESET}}$	Reset. The AD1852 is reset on the rising edge of this signal. The serial control port registers are reset to the default values. Connect HI for normal operation.
25	I	L/$\overline{\text{R}}$CLK	Left/$\overline{\text{Right}}$ Clock Input for Input Data. Must run continuously.
26	I	BCLK	Bit Clock Input for Input Data. Need not run continuously; may be gated or used in a burst fashion.
27	I	SDATA	Serial Input, MSB first, containing two channels of 16, 18, 20, and 24 bits of twos complement data per channel.
28	I	DVDD	Digital Power Supply Connect to digital 5 V supply.

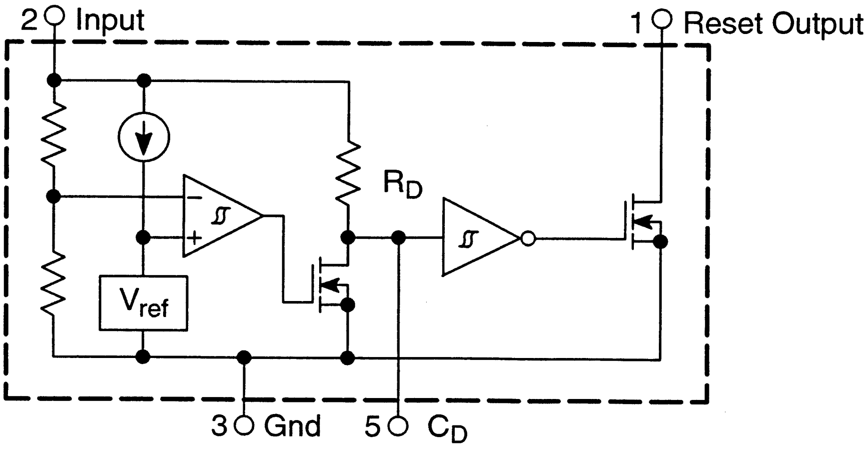
Table I. Serial Data Input Mode

IDPM1 (Pin 20)	IDPM0 (Pin 21)	Serial Data Input Format
0	0	Right-Justified
0	1	I^2S-Compatible
1	0	Left-Justified
1	1	DSP

9.8.3 ICs Digital Board Chrysalis

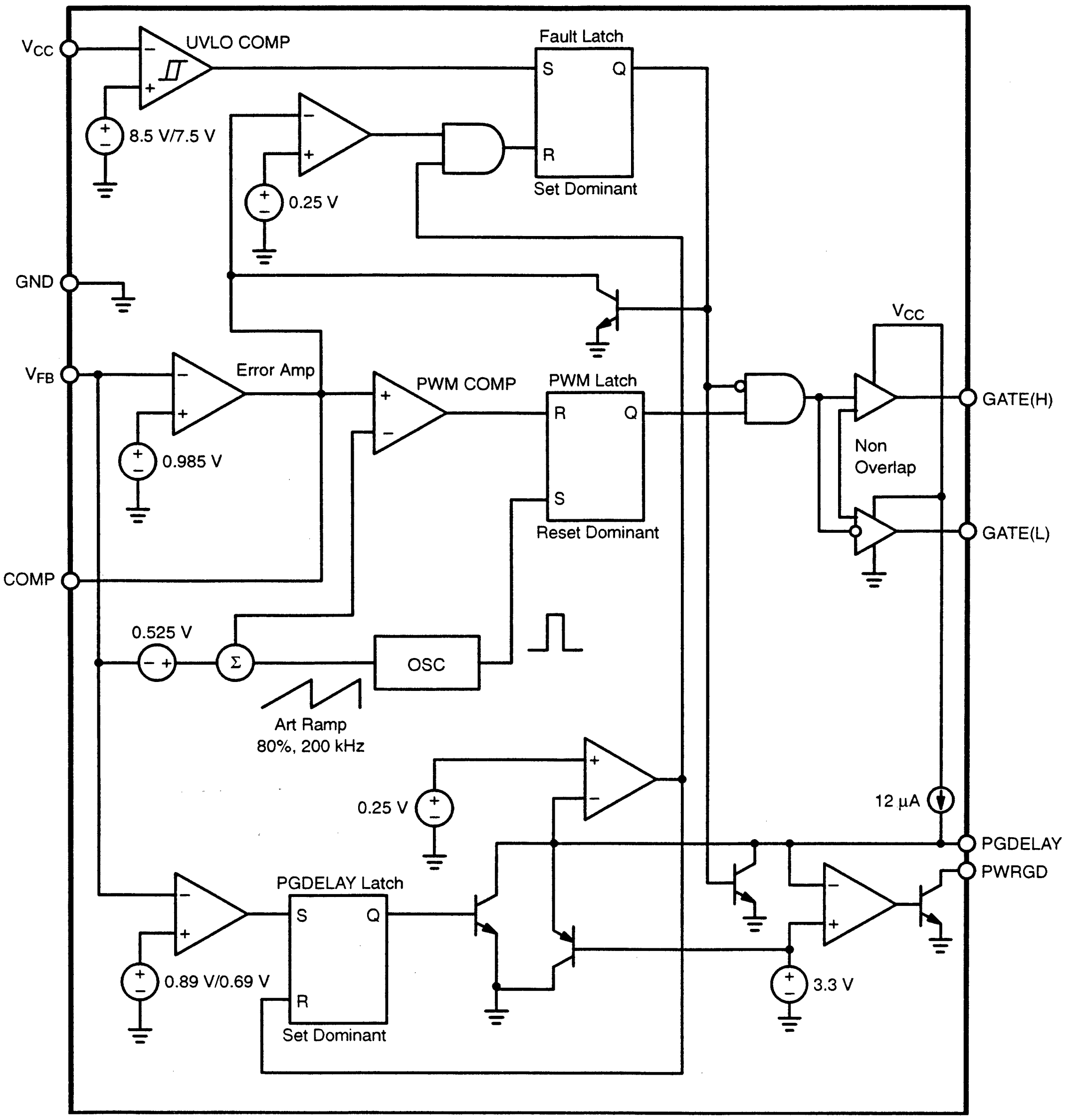
IC7106 NCP303LSN29, Digital Board 2.1 Chrysalis, Reset Circuit

NCP303LSNxxT1
Open Drain Output Configuration


2 Input
1 Reset Output
R$_D$
V$_{ref}$
3 Gnd
5 C$_D$

IC7501 NCP1570D, Digital Board 2.1 Chrysalis, DC/DC Converter Control

NCP1570

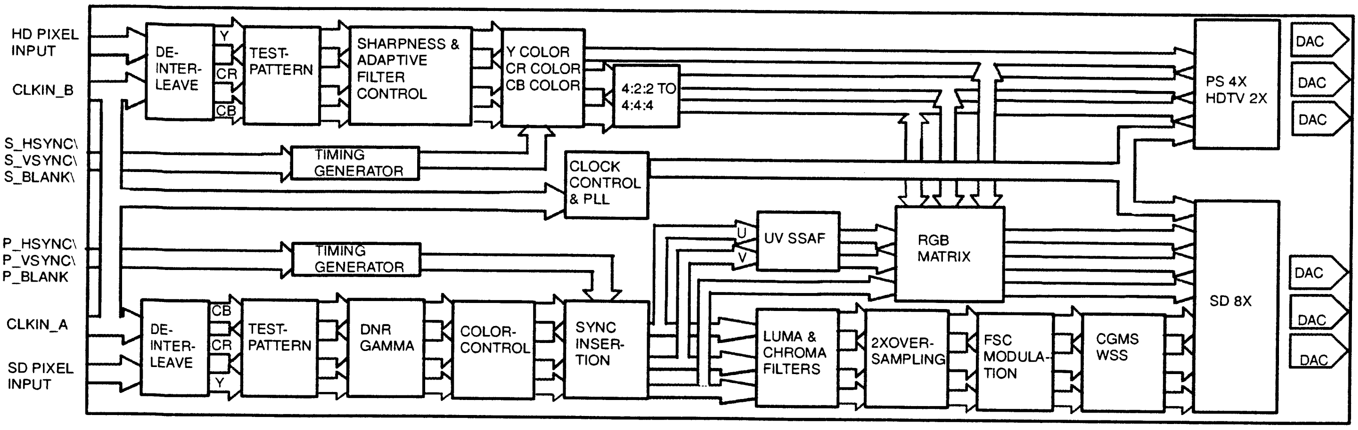

Vcc
UVLO COMP
8.5 V/7.5 V
Fault Latch
S
Q
R
Set Dominant
0.25 V
GND
Vcc
VFB
Error Amp
0.985 V
PWM COMP
PWM Latch
R
Q
S
Reset Dominant
GATE(H)
Non Overlap
GATE(L)
COMP
0.525 V
Σ
OSC
Art Ramp
80%, 200 kHz
0.25 V
12 µA
PGDELAY
PWRGD
PGDELAY Latch
S
Q
R
Set Dominant
0.89 V/0.69 V
3.3 V

PACKAGE PIN DESCRIPTION

PACKAGE PIN #		
SO–8	PIN SYMBOL	FUNCTION
1	V_{CC}	Power supply input.
2	PWRGD	Open collector output goes low when V_{FB} is out of regulation. User must externally limit current into this pin to less than 20 mA
3	PGDELAY	External capacitor programs PWRGD low–to–high transition delay.
4	COMP	Error amp output. PWM comparator reference input. A capacitor to LGND provides error amp compensation and Soft Start. Pulling pin < 0.45 locks gate outputs to a zero percent duty cycle state.
5	GATE(H)	High–side switch FET driver pin. Capable of delivering peak currents of 1.5 A.
6	GATE(L)	Low–side synchronous FET driver pin. Capable of delivering peak currents of 1.5 A.
7	V_{FB}	Error amplifier and PWM comparator input.
8	GND	Power supply return.

IC7703: ADV7302 Digital Board, Multi Format Progressive Scan Video Encoder

Block diagram of the ADV7302A/03A


HD PIXEL INPUT
CLKIN_B
S_HSYNC\
S_VSYNC\
S_BLANK\
P_HSYNC\
P_VSYNC\
P_BLANK
CLKIN_A
SD PIXEL INPUT
DE-INTER-LEAVE
Y
CR
CB
TEST-PATTERN
SHARPNESS & ADAPTIVE FILTER CONTROL
Y COLOR
CR COLOR
CB COLOR
4:2:2 TO 4:4:4
TIMING GENERATOR
CLOCK CONTROL & PLL
TIMING GENERATOR
DNR GAMMA
COLOR-CONTROL
SYNC INSER-TION
U
V
UV SSAF
RGB MATRIX
LUMA & CHROMA FILTERS
2XOVER-SAMPLING
FSC MODULA-TION
CGMS WSS
PS 4X HDTV 2X
SD 8X
DAC
DAC
DAC
DAC
DAC
DAC

PIN FUNCTION DESCRIPTIONS

Pin Mnemonic	Input/Output	Function
DGND	G	Digital Ground
AGND	G	Analog Ground
CLKIN_B	I	Pixel Clock Input. Requires a 27MHz reference clock for Progressive Scan Mode or a 74.25MHz (74.1758MHz) reference clock in HDTV mode. This clock input pin is only used in simultaneous SD and HD mode.
CLKIN_A	I	Pixel Clock Input for HD only or SD only modes.
COMP 1,2	O	Compensation Pin for DACs. Connect 0.1 µF Capacitor from COMP pin to V_{AA}.
DAC A	O	CVBS/ GREEN/ Y SD analog output.
DAC B	O	Luma/ BLUE/ U SD analog output.
DAC C	O	Chroma/ RED/ V SD analog output.
DAC D	O	in SD only mode: CVBS/GREEN/ Y analog output in HD only mode and simultaneous HD/SD : Y/ GREEN (HD) analog output.
DAC E	O	in SD only mode: Luma/BLUE/ U analog output in HD only mode and simultaneous HD/SD : Pr/ RED (HD) analog output.
DAC F	O	in SD only mode: Chroma/RED/ V analog output in HD only mode and simultaneous HD/SD : Pb/ BLUE (HD) analog output.
P_BLANK	I	Video Blanking Control Signal for HD sync in simultaneous SD/HD mode and HD HD only mode.
P_HSYNC	I	Video Horizontal Sync Control Signal for HD sync in simultaneous SD/HD mode and HD only mode.
P_VSYNC	I	Video Vertical Sync Control Signal for HD sync in simultaneous SD/HD mode and HD only mode.
S_BLANK	I/O	Video Blanking Control Signal for SD.
S_HSYNC	I/O	Video Horizontal Control Signal for SD. Option to o/p SD HSYNC or HD HSYNC in SD Slave Mode 0 and/or any HD mode.
S_VSYNC	I/O	Video Vertical Control Signal for SD. Option to o/p SD VSYNC or SD HSYNC in SD Slave Mode 0 and/or any HD mode.
C7-0	I	8-Bit Progressive scan/ HDTV input port for CrCb color data in 4:2:2 input mode. In 4:4:4 input mode this input port is used for the Cb [Blue/U] data. The LSB is set up on pin C0. In default mode the input on this port is output on DAC E.
Y7-0	I	8-Bit Progressive scan/ HDTV input port for Y data. The LSB is set up on pin Y0. In default mode the input on this port is output on DAC D.
S7-S0	I	8-Bit Standard Definition input port. Or Progressive Scan/ HDTV input port for Cr [Red/V] color data in 4:4:4 input mode. The LSB is set up on pin S0. In default mode the input on this port is output on DAC F.
RESET	I	This input resets the on-chip timing generator and sets the ADV7302A/03A into Default Register setting. Reset is an active low signal.

$R_{SET1,2}$	I	A 760 Ohms resistor must be connected from this pin to AGND and is used to control the amplitudes of the DAC outputs.
SCL	I	Multifunctional input: MPU Port Serial Interface Clock Input.
SDA	I/O	Multifunctional pin: MPU Port Serial Data Input/Output.
ALSB	I	Multifunctional pin. TTL Address Input. This signal sets up the LSB of the MPU address. When this pin is tied low the I2C filter is activated which reduces noise on the I2C interface. When this pin is tied high, the input bandwidth on the I2C lines is increased.
I2C	I	When this input pin is tied high [Vdd_IO], the ADV7302A/03A interfaces over the I2C port.
V_{DD_IO}	P	Power supply for digital i/ps and o/ps
V_{DD}	P	Digital power supply
V_{AA}	P	Analog power supply
V_{REF}	I/O	Optional External Voltage Reference Input for DACs or Voltage Reference Output (1.235V).
EXT_LF	I	External Loop filter for the internal PLL.
RTC_SCR_TR	I	Multifunctional Input: Real Time Control (RTC) input, Timing Reset input, Subcarrier Reset input.

9.9 List of Abbreviations

Analog Board

+5VSTBY	Permanent Supply 5V
8SC2	Pin8 Scart2 (only for Europe)
A_DATA	Data from Analog- to Digital-Board (UART-Communication)
A_RDY	Analog-board ready (status information to digital-board)
A18 - A19	Parallel Address Bus (CC - Flash-ROM and S-RAM)
A8 - A17	Parallel Address Bus (CC - Flash-ROM and S-RAM)
AD0 - AD7	Parallel Address Bus (CC - Flash-ROM and S-RAM)
AFC	Automatic Frequency Control
AFEL	Audio Frontend Left
AFER	Audio Frontend Right
AGC / WSRI	Automatic Gain Control (for Europe), Wide Screen Rear In (for NTSC)
AINFL	Audio In Front Left
AINFR	Audio In Front Right
AKILL	Audio Kill Signal
ALADC	Audio Left to ADC
ALDAC	Audio Left from DAC
ALE	Address Latch Enable
AM0	Adress-mode 0
AM1	Adress-mode 1
ARADC	Audio Right to ADC
ARDAC	Audio Right from DAC
ASCC1	Audio Scart 1 Mute (System Clock Output for Real time Clock-Adjustment)
AVCC	Power Supply for A/D-converter
AVSS	GND-Pin for A/D-converter
CFIN	Chroma Front In
CS0_	Chip Select 0 (CC - S-RAM)
CS2_	Chip Select 2 (CC - Flash-ROM)
CVBSFIN	Video Front In
D_DATA	Data from Digital- to Analog-Board (UART-Communication)
D_RDY	Digital-board ready (status information from digital-board)
DAC_MUTE	Mute Signal for DAC
DAOUT	Digital Audio Out
DVAL	Audio from Digital Video In Left
DVAR	Audio from Digital Video In Right
DVCC1	Power Supply Pin
DVCC2	Power Supply Pin
DVCC3	Power Supply Pin
DVSS1	GND Pin
DVSS2	GND Pin
DVSS3	GND Pin
FAN_OFF	Fan for Basic engine
FBIN	Fast Blanking input
FOME	FOllow ME Status line (matching signals yes/no; only for Europe)
G1...10	DISPLAY GRID
INT	Interrupt OUT for the CC
INT	Interrupt – line from Display Print
ION	Inverse ON-Line
IPFAIL	Inverse Power Fail Detection
IPOR	Inverse Power On Reset
IRESET	Inverse Reset Input
K1	Key-Input-Line
K2	Key-Input-Line
KILL	Signal from IR-Receiver
P50 IN	P50 INput-line (only for Europe)
P50 OUT	P50 OUTput-line (only for Europe)
POR_DC	Power On Reset for Display Control Print (Ext_DL)
PSS	Output Enable ReaD (CC - Flash-ROM and S-RAM)
PWM_FIL	Control line for Filament Voltage Generation
PWONSW	Amplifier Switch Audio A/D Converter
RD_	Pal/Secam-Select
RECLED	Control Signal for REC-LED
RESET_DIG	Reset Line to Digital Board
RP_	Inverse Reset line to Flash-ROM
RSA1/2	Record Selector 1/2

RY/BY_	Ready/Busy – input line (from Flash-ROM)
SIF1	Sound intermediate frequency
SB1	Secam Band 1 (PCB-Test entrance)
SCL	IC-Bus
SCLSW	Switched I^{2}C-Bus
SDA	IC-Bus
SDASW	Switched I^{2}C-Bus
SFS_TS	SAW Filter Select Trap Select
STBY	Standby-Line (Flash_Toshiba)
SYNC	Video Sync input
TEMP_SENSE	Temperature Sense Line
VER	HW-version input
VFV	Video from Frontend
VKK	VFT Driver Power Supply
VREFH	Pin for Reference-voltage input to A/D-converter
VREFL	Pin for Reference-voltage input to A/D-converter
VS1/2	View Selector 1/2
WR_	Write Enable (CC - Flash-ROM and S-RAM)
WSFI	Wide Screen Signalling Front In
WU	Wake Up
X1	Oscillator Pin
X12	Oscillator Pin
XIN	Oscillator Pin
XOUT	Oscillator Pin
XT1	Low Frequency Oscillator Pin
XT2	Low Frequency Oscillator Pin
YFIN	Luminance Front In

Digital Board Chrysalis

ADC	Analog to Digital Converter
DAC	Digital to Analog Converter
DENC	Digital (Video) Encoder (Video DAC)
DV	Digital Video (Camcorder)
EF	Emitter Follower
OSD	On-Screen Display
VIP	Video Input Processor (Video ADC)
2Fh	Progressive scan video
2V5	+2V5 Power supply for Link+Codec IC7431
3V3	+3V3 Power supply
3V3_A	+3V3 Analog power supply for PHY IC7400
3V3_D	+3V3 Digital power supply for PHY IC7400
3V3_DLY	+3V3 Power supply for IC7500
3V3_LINK	+3V3 Power supply for Link+Codec IC7431
3V3_F	+3V3 Power supply for optional Flash memory IC7432
3V3_RAM	+3V3 Power supply for SDRAM IC7430
3V3_uP	+3V3 Power supply for Micro-controller IC7802
3V3_32kHz	+3V3 Power supply for audio format adaptation circuitry IC7507 and IC7508
3V3_AC	+3V3 Power supply for audio system clock generator IC7605 and IC7606
+5V	+5V Power supply
5V_PLL	+5V Power supply for VCO of audio PLL IC7604
A (1:17)	Flash address lines of uPD72893
A_MUTE	Audio Mute
ABCK	Audio Bit Clock
AD (1:10)	Address bus lines for Host I/F of Link+Codec IC7431
AEMP1	PCM1 emphasis ON/OFF for PCM1 output
AFS1	Audio sampling frequency indication signal
ALRCLK	Audio Word Select
AMCLK44	11.2896MHz (=256 * 44.1 kHz) audio master clock signal for 44.1 kHz audio
AMCLK48	12.288MHz (=256 * 48 kHz) audio master clock signal for 32 kHz and 48 kHz audio
APWM	PWM signal for audio PLL
ASIC	Application Specific Integrated Circuit
BUFENn_AUD	Buffer Enable Audio
BUFENn_VID	Buffer Enable Video
CLK27M_CON	27MHz Clock to Digital Board
CS	Parallel interface chip select input of Link+Codec IC7431
CTL (0:1)	Link interface control lines
CTSN	Clear to Send
D (0:15)	Flash data lines of Link+Codec IC7431
DCDi	Directional Correlational Deinterlacing. Circuitry that reduces jaggies on diagonal edges when deinterlacing video-sourced material.
DV_STATUS	Interrupt pin for reading DV-status
HS_CLK	Video clock input of Link+Codec IC7431
INT	Interrupt request output of Link+Codec IC7431 (input to Micro-Controller)
IOR	Parallel interface IO read control input of Link+Codec IC7431
ISPN	In System Programming signal (used for programming IC7802)
LKON	Link-on signal outputLPSLink power status inputLREQLink request input
MA (0:10)	SDRAM address lines of Link+Codec IC7431
MCAS	SDRAM column address strobe signal
MCLK	SDRAM clock signal
MD (0:15)	SDRAM data lines of Link+Codec IC7431
MRAS	SDRAM row-address strobe signal
MWE	SDRAM write enable signal
PCM1	Audio Serial Data Output of Link+Codec IC7431
PCM1_NEW	'MSB justified' to I2S converted audio serial data; audio serial data input of audio DAC UDA1334A
PD (0:15)	Data bus lines for Host I/F of Link+Codec IC7431
PHY_D (0:7)	Data bus connection between PHY and LINK device
RESETn	DVIO board reset
RESET_FM	Reset signal driven by Flashmaster programming device
RESTB	Reset input of Link+Codec IC7431
RTSN	Request to Send
RWZ	Parallel interface read/write control input of Link+Codec IC7431
RXD	Receive Data
SCLK	Link control output clock
TXD	Transmit Data
VPP	+10V switchable programming voltage of microcontroller
YUV (0:7)	Digital Video

10. Spare Parts List

10.1 Exploded View of the Set

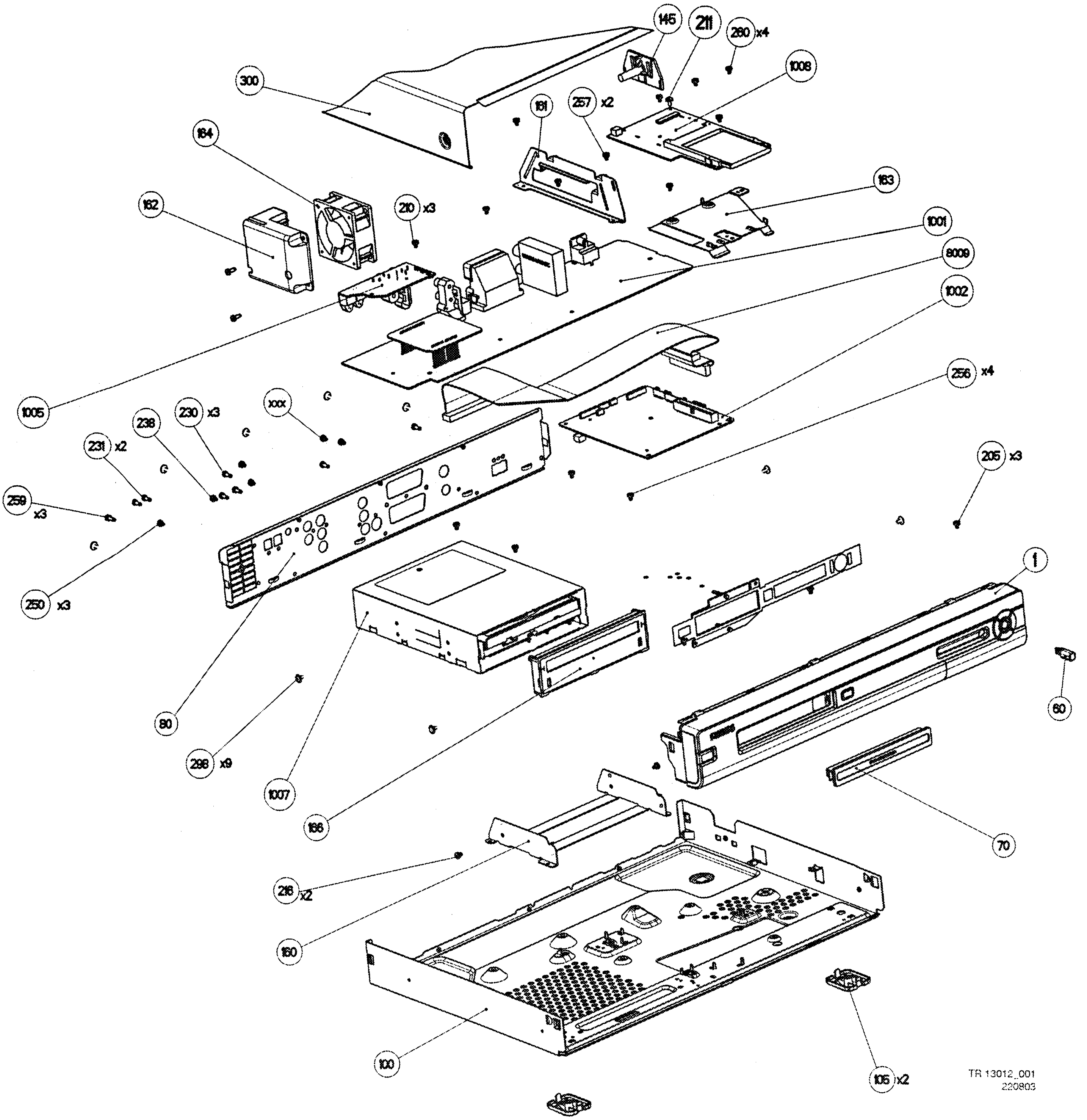

145
211
260 x4
1008
300
161
257 x2
184
163
162
210 x3
1001
8009
1002
1005
256 x4
238
230 x3
xxx
231 x2
205 x3
259 x3
250 x3
1
60
80
298 x9
1007
166
70
218 x2
160
100
105 x2
TR 13012_001
220803

Figure 10-1

10.2 Exploded View of the Front Panel Complete

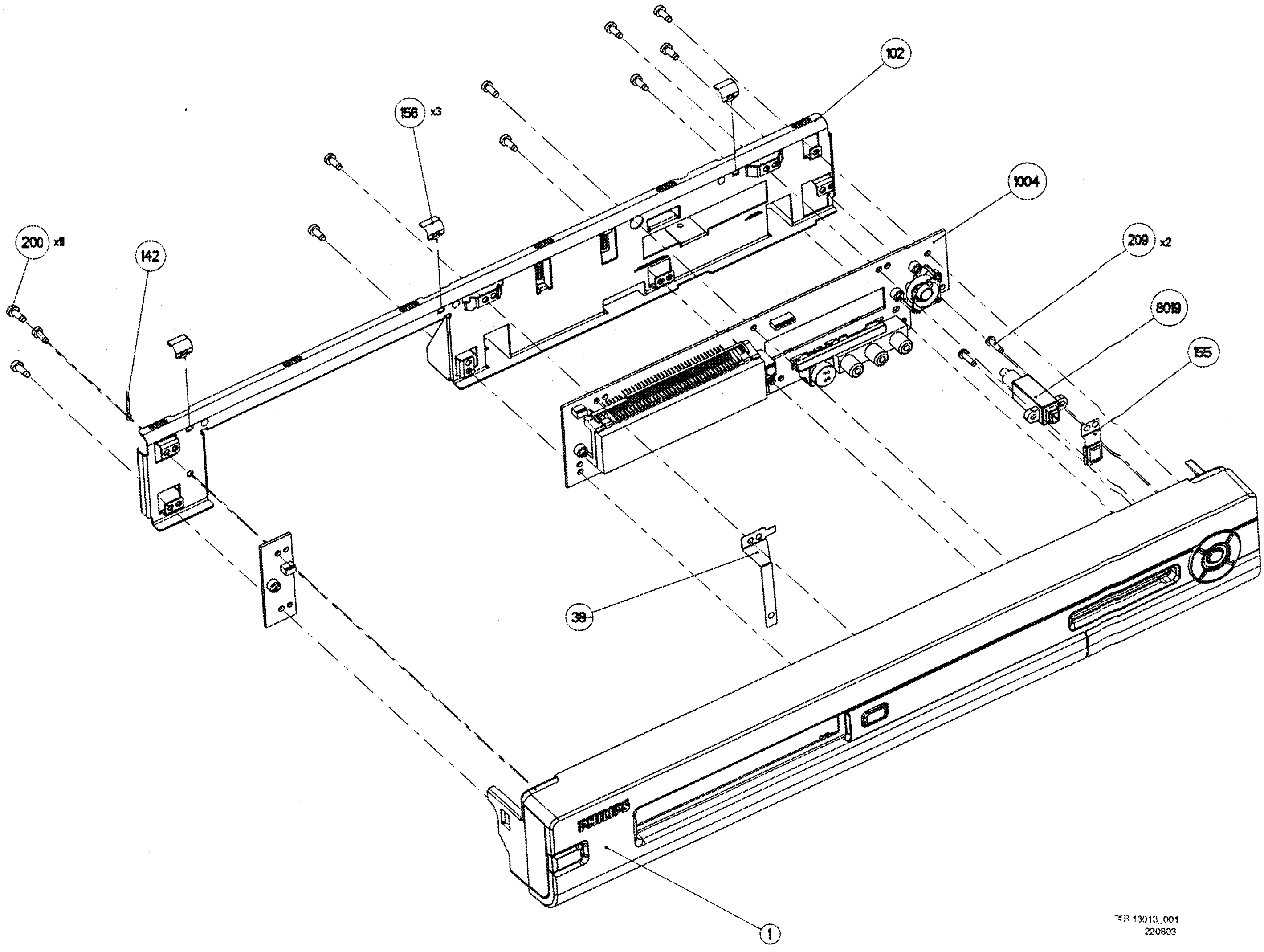

102
156 x3
1004
200 x11
142
209 x2
8019
155
38
PHILIPS
1
TR 13013_001
220803

Figure 10-2

10.3 Exploded View of the Front without PWBs

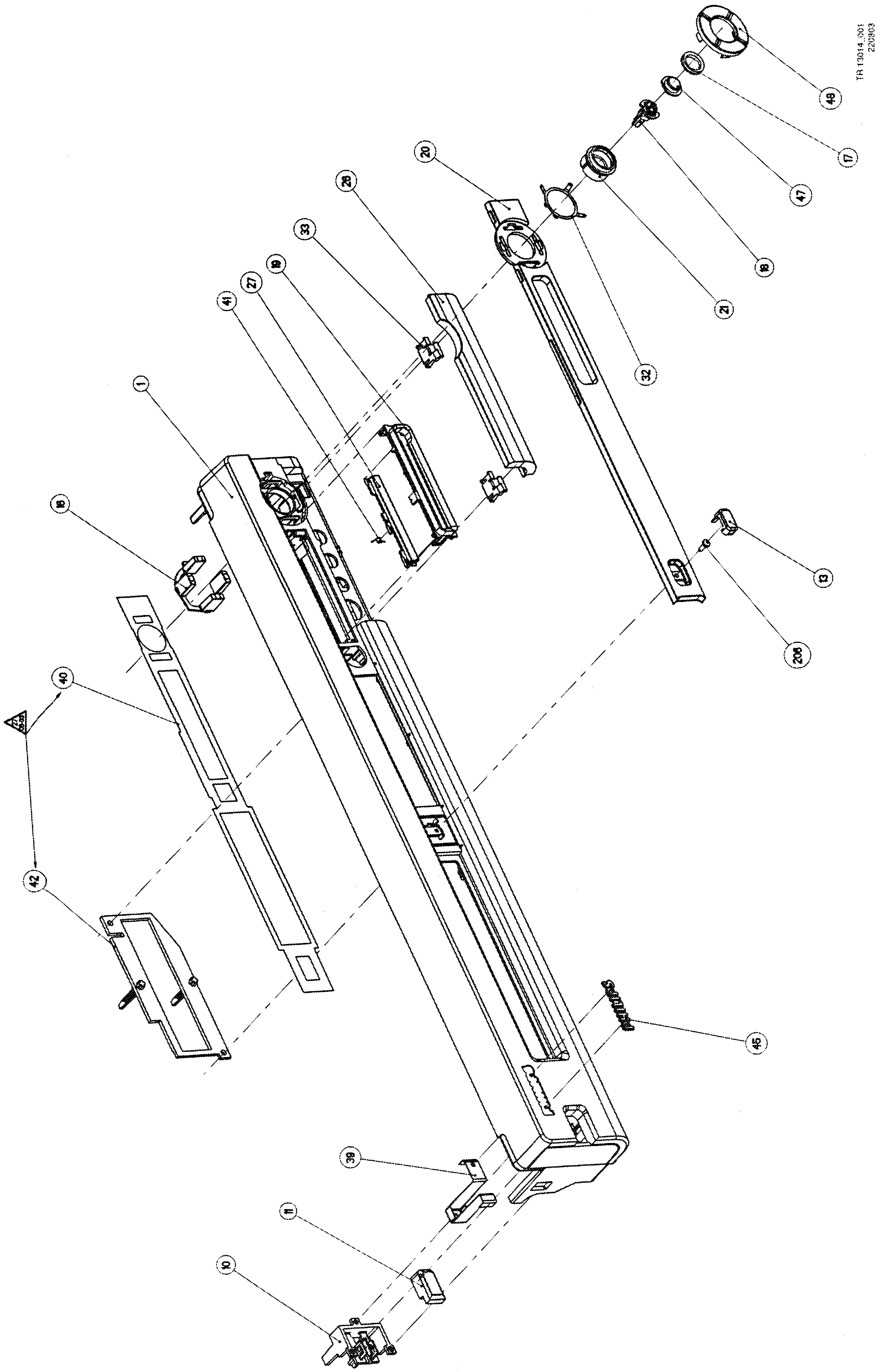

TR 13014_001
220803
48
17
47
18
21
32
20
28
33
19
27
41
1
16
40
42
13
208
45
39
11
10

Figure 10-3

Mechanical

Various

0001	3103 607 90551	PANEL FRONT UK
0001	3103 607 90831	PANEL FRONT 730/EU
0011	3103 607 50341	BUTTON CAP STAND BY
0013	3103 607 50361	BUTTON CAP OPEN CL.
0020	3103 607 50611	WINDOW DISPLAY
0026	3103 607 50961	DOOR FRONT AV UK
0026	3103 607 51381	DOOR FRONT AV 730/EU
0033	3103 604 00441	HINGE DOOR FRONT AV
0047	3103 607 50411	BUTTON CAP RECORD
0048	3103 607 50991	RING ROCKER PL/ PAUSE
0048	3103 607 51101	RING ROCKER PL/ PAUSE
0060	3103 607 50671	BUTTON CAP EJECT ASSY
0070	3103 607 90411	COVER TRAY
0105	3103 607 50491	FOOT ASSY
0164	3103 308 52950	FAN KD120 6PTS 3 - C112
0300	3103 607 50681	COVER ASSY
0350	3128 147 15411	RC19046005/01
0351	2422 070 98133	MAINSCORD EUR 1M5 BK
0351	4822 321 10713	MAINS CORD UK
0352	2422 076 00532	CBLE SCART 1M5
0357	4822 320 50377	CONNECT. CABLE PAL
1008	2822 062 41022	CARD READER WRITER IIA
8004	3103 601 00220	FFC 10-POL-D-TYP 350MM (UP-DB)
8005	3103 601 00230	FFC 22-POL-A-TYP 210MM (AB-DB)
8008	3103 601 00441	CBLE KR 12P/130/12P UL
8009	3103 601 00461	CBLE IDE 40P/470/40P UL
8010	3103 601 00280	FFC 10-POL-A-TYP 650MM (AB-DC)
8012	3103 601 00471	CBLE EHR 4P/180/4P LC UL
8013	3103 601 00310	KR 9POL GESCH 370MM
8019	3103 601 00360	IEEE 1394 CHRYSALIS 350MM
8020	3103 601 00370	FFC 6-POL-D-TYP 220MM (DIO-DB)
8026	3103 601 00431	FFC 22-POL-A-TYP 245MM (AB-DB)
8028	3103 601 00481	CBLE KR 2P/230/2P KR UL
8029	3103 601 00320	FFC 7-POL-D-TYP 280MM (DIO-EP)

Display Board

Various

1110	4822 242 82114	EFOEC8004/T4
1130	4822 276 13732	Tact switch
1165	4822 276 13732	Tact switch
1166	4822 276 13732	Tact switch
1167	4822 276 13732	Tact switch
1168	4822 276 13732	Tact switch
1169	4822 276 13732	Tact switch
1170	4822 276 13732	Tact switch
1910	4822 267 11031	10P. FEM. V
1911	3103 601 00180	CABLE TREE ASSY 2 POL
1920	2422 026 05301	SOC CINCH V 3P
1921	2422 026 05307	CON MDIN H 4P F YKF51
1922	2422 025 10185	CON H 9P M

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2100	5322 126 11583	10nF 10% 50V 0603
2101	3198 017 34730	47nF 16V 0603
2102	4822 124 11946	22µF 20% 16V
2103	5322 126 11583	10nF 10% 50V 0603
2104	2238 586 59812	100nF 20-80% 50V 0603
2110	4822 124 21732	10µF 20% 25V
2111	3198 017 34730	47nF 16V 0603
2112	4822 126 13879	220nF 20% 16V
2113	5322 121 42498	680nF 5% 63V
2114	5322 126 11578	1nF 10% 50V 0603
2115	3198 024 44730	47nF 50V 0603
2116	4822 124 11946	22µF 20% 16V
2117	4822 124 81151	22µF 50V
2118	2020 552 94427	100pF 5% 50v 0603
2119	2020 552 94427	100pF 5% 50v 0603
2120	2020 552 94427	100pF 5% 50v 0603
2121	2020 552 94427	100pF 5% 50v 0603
2122	2020 552 94427	100pF 5% 50v 0603
2123	2020 552 94427	100pF 5% 50v 0603
2124	2020 552 94427	100pF 5% 50v 0603
2125	2020 552 94427	100pF 5% 50v 0603
2126	2020 552 94427	100pF 5% 50v 0603
2200	4822 126 14241	330pF 50V 0603
2201	4822 126 14241	330pF 50V 0603
2202	2238 586 59812	100nF 20-80% 50V 0603

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3100	4822 051 30223	22kΩ 5% 0.062W
3101	4822 051 30223	22kΩ 5% 0.062W
3102	4822 051 30222	2.2kΩ 5% 0.062W
3103	4822 051 30221	220Ω 5% 0.062W
3104	4822 051 30103	10kΩ 5% 0.062W
3106	4822 117 12925	47kΩ 1% 0.063W 0603
3107	4822 051 30222	2.2kΩ 5% 0.062W
3108	4822 117 12925	47kΩ 1% 0.063W 0603
3110	4822 051 30221	220Ω 5% 0.062W
3111	4822 051 30223	22kΩ 5% 0.062W
3112	4822 050 11002	1kΩ 1% 0.4W
3113	4822 051 30102	1kΩ 5% 0.062W
3114	4822 051 30101	100Ω 5% 0.062W
3115	4822 051 30101	100Ω 5% 0.062W
3116	4822 051 30331	330Ω 5% 0.062W
3117	4822 051 30103	10kΩ 5% 0.062W
3118	4822 051 30331	330Ω 5% 0.062W
3119	4822 051 30471	470Ω 5% 0.062W
3120	4822 051 30102	1kΩ 5% 0.062W
3121	4822 116 83872	220Ω 5% 0.5W
3122	4822 051 30103	10kΩ 5% 0.062W
3123	4822 051 30471	470Ω 5% 0.062W
3124	4822 051 30103	10kΩ 5% 0.062W
3125	4822 051 30471	470Ω 5% 0.062W
3126	4822 051 30101	100Ω 5% 0.062W
3127	4822 117 13632	100kΩ 1% 0603 0.62W
3128	4822 117 13632	100kΩ 1% 0603 0.62W
3130	4822 051 30103	10kΩ 5% 0.062W
3132	4822 051 30102	1kΩ 5% 0.062W
3134	4822 117 12063	NTC DC 5W 10K 5%
3137	4822 116 83876	270Ω 5% 0.5W
3139	4822 116 83876	270Ω 5% 0.5W
3141	4822 117 12925	47kΩ 1% 0.063W 0603
3144	4822 051 30103	10kΩ 5% 0.062W
3147	4822 051 30223	22kΩ 5% 0.062W
3148	4822 051 30223	22kΩ 5% 0.062W
3149	4822 051 30223	22kΩ 5% 0.062W
3150	4822 051 30223	22kΩ 5% 0.062W
3151	4822 051 30223	22kΩ 5% 0.062W
3152	4822 051 30223	22kΩ 5% 0.062W
3153	4822 051 30223	22kΩ 5% 0.062W
3200	4822 051 30102	1kΩ 5% 0.062W
3201	4822 051 30105	1MΩ 5% 0.062W
3202	4822 051 30102	1kΩ 5% 0.062W
3203	4822 051 30105	1MΩ 5% 0.062W
3204	4822 051 30689	68Ω 5% 0.063W 0603
3205	4822 051 30759	75Ω 5% 0.062W
3206	4822 051 30759	75Ω 5% 0.062W
3207	4822 051 30759	75Ω 5% 0.062W
3300	4822 051 30472	4.7kΩ 5% 0.062W
4112	4822 051 30008	Jumper 0603
4113	4822 051 20008	Jumper 0805
4121	4822 051 30008	Jumper 0603
4122	4822 051 30008	Jumper 0603
4123	4822 051 30008	Jumper 0603

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5100	4822 157 11706	10µH 5%
5101	2422 549 44607	Bead 600Ω at 100MHz
5103	2422 549 44607	Bead 600Ω at 100MHz
5104	4822 157 50964	100µH 20%

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6100	4822 130 11416	PDZ6.8B
6101	9322 190 44676	LTL-1MHHR
6102	9322 190 44676	LTL-1MHHR
6103	9322 190 44676	LTL-1MHHR
6105	4822 130 11397	BAS316
6106	4822 130 11397	BAS316
6111	4822 130 11397	BAS316
6200	9322 146 61685	DF3A6.8FU
6201	9322 146 61685	DF3A6.8FU
6202	9322 146 61685	DF3A6.8FU
6203	9322 146 61685	DF3A6.8FU
6204	9322 146 61685	DF3A6.8FU

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7100	2722 171 07736	VFD BJ900GNK
7101	3198 010 42310	BC847BW
7102	3198 010 42310	BC847BW
7103	3103 165 13731	TMP87C874F/LDCP1
7104	3198 010 42310	BC847BW
7105	3198 010 42310	BC847BW
7106	4822 130 40981	BC337-25
7107	9322 185 95667	TSOP4836
7108	4822 130 41246	BC327-25
7109	3198 010 42310	BC847BW
7112	4822 130 60854	DTA124EU-W

Analog Board

Various

1001	2422 086 10919	Fuse 65V 125mA
1300	4822 253 30383	19181 (2,5A)
1301	4822 265 11253	Fuse holder 2p
1302	4822 252 11215	Spark gap
1303	4822 071 51002	19372(1A)
1304	2422 086 10786	FUSE 4A
1304	4822 071 54002	19372(4A)
1306	2422 086 10919	Fuse 65V 125mA
1307	4822 071 51002	19372(1A)
1308	2422 086 10951	PROT DEV 65V 500MA PSC
1308	4822 252 51187	19398E1(0,500A)
1309	2422 086 10783	FUSE RAD LT 2A 250V IECA
1309	9965 000 07788	FUSE RAD T2A IEC UL250V
1600	4822 242 10434	Crystal 18.432 MHz
1701	4822 242 81436	Filter OFWK3953M
1702	2422 549 44341	SAW 38.9MHz OFWK9656M
1703	4822 242 10307	OFWG3956M
1704	2422 549 44611	FIL CER 5MHZ5 TPSR*MBQ2 BS
1704	4822 242 72586	TPS5,5MB-TF20
1705	3139 147 17001	TUNER UV1316MK3
1900	2422 025 18009	CON V 22P F
1900	4822 265 11154	Connector 22p
1931	2422 030 00304	Socket 2P m h mains
1931	2422 030 00413	SOC POW 2P M
1932	2422 025 10772	CON V 12P M
1934	4822 267 10565	Connector 4p
1935	2422 025 09405	CON 2P M
1940	2422 033 00334	CON BM EURO H 42P
1942	2422 025 10769	CON 9P VERT
1943	2422 025 18143	CON V 10P F
1943	4822 267 11031	10P. FEM. V
1947	2422 025 18009	CON V 22P F
1947	4822 265 11154	Connector 22p
1948	4822 267 10994	Socket SVHS
1949	2422 026 05308	SOC CINCH H 3P
1990	4822 242 73552	13,875 000 MC

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2000	4822 124 80483	47µF20% 6,3V
2001	4822 124 42234	100µF 20% 6,3V
2002	4822 124 42234	100µF 20% 6,3V
2003	2238 586 59812	100nF 20-80% 50V 0603
2004	2238 586 59812	100nF 20-80% 50V 0603
2006	2238 916 11449	1NF 2%NPO 25V 0603
2008	2238 916 11449	1NF 2%NPO 25V 0603
2009	2020 552 94427	100pF 5% 50v 0603
2011	2238 586 59812	100nF 20-80% 50V 0603
2012	2238 586 59812	100nF 20-80% 50V 0603
2015	3198 017 41050	1µF 10V 0603
2017	2020 552 94427	100pF 5% 50v 0603
2018	4822 124 21732	10µF 20% 25V
2019	4822 124 21732	10µF 20% 25V
2020	4822 124 21732	10µF 20% 25V
2021	2238 586 59812	100nF 20-80% 50V 0603
2022	3198 017 41050	1µF 10V 0603
2023	2238 916 11449	1NF 2%NPO 25V 0603
2025	2238 916 11449	1NF 2%NPO 25V 0603
2030	2238 916 11449	1NF 2%NPO 25V 0603
2032	2238 916 11449	1NF 2%NPO 25V 0603
2033	2020 552 94427	100pF 5% 50v 0603
2035	2238 586 59812	100nF 20-80% 50V 0603
2037	2238 586 59812	100nF 20-80% 50V 0603
2038	4822 124 42234	100µF 20% 6,3V
2041	2020 552 94427	100pF 5% 50v 0603
2042	2238 586 59812	100nF 20-80% 50V 0603
2043	4822 124 80483	47µF20% 6,3V
2045	2238 916 11449	1NF 2%NPO 25V 0603
2047	2238 916 11449	1NF 2%NPO 25V 0603
2048	2020 009 90097	100µF BP 16V 20%
2048	2022 036 00005	10µF 16V 20%
2048	4822 124 12392	47?F 20% 16V
2049	5322 126 11583	10nF 10% 50V 0603
2050	2020 009 90097	100µF BP 16V 20%
2050	2022 036 00005	10µF 16V 20%
2050	4822 124 12392	47?F 20% 16V
2301	2020 554 90173	2.2nF 20% 250V
2302	4822 121 10512	220nF 275V 20%
2303	4822 122 31175	1nF 10% 500V
2304	4822 121 51598	2.2nF 5% 400V
2305	2020 021 91506	1000µF 20% 16V

2306	2020 021 91528	560µF 6V3 20%
2307	4822 122 31175	1nF 10% 500V
2308	2022 318 00108	47nF 250V 10%
2308	4822 121 70386	47nF 10% 250V
2309	2222 151 90053	68µF 400V 20%
2310	5322 126 11578	1nF 10% 50V 0603
2311	5322 126 11578	1nF 10% 50V 0603
2312	2020 021 91506	1000µF 20% 16V
2313	2020 021 91528	560µF 6V3 20%
2315	4822 126 14525	47pF 5% 1kV
2317	5322 126 11578	1nF 10% 50V 0603
2318	4822 126 10206	2.2nF 10% 500V
2319	2020 021 91506	1000µF 20% 16V
2320	4822 124 40849	330µF 20% 16V
2321	2238 586 59812	100nF 20-80% 50V 0603
2322	2020 021 91506	1000µF 20% 16V
2323	4822 124 42234	100µF 20% 6,3V
2324	2238 586 59812	100nF 20-80% 50V 0603
2325	4822 124 81151	22µF 50V
2326	4822 121 41857	10nF 5% 250V
2327	2238 586 59812	100nF 20-80% 50V 0603
2328	4822 124 81151	22µF 50V
2329	2238 586 59812	100nF 20-80% 50V 0603
2330	5322 126 11578	1nF 10% 50V 0603
2331	2238 586 59812	100nF 20-80% 50V 0603
2332	4822 124 22651	1µF 20% 50V
2334	2238 586 59812	100nF 20-80% 50V 0603
2335	4822 124 21732	10µF 20% 25V
2336	2238 586 59812	100nF 20-80% 50V 0603
2338	2238 586 59812	100nF 20-80% 50V 0603
2339	3198 017 41050	1µF 10V 0603
2340	2020 554 90169	470pF 250V 10%
2341	3198 017 41050	1µF 10V 0603
2342	3198 017 41050	1µF 10V 0603
2343	2238 586 59812	100nF 20-80% 50V 0603
2402	2238 586 59812	100nF 20-80% 50V 0603
2403	4822 124 80483	47µF20% 6,3V
2404	2238 586 59812	100nF 20-80% 50V 0603
2405	4822 124 80483	47µF20% 6,3V
2406	5322 126 11583	10nF 10% 50V 0603
2407	4822 122 33741	10pF 10% 50V
2408	3198 017 41050	1µF 10V 0603
2409	2238 586 59812	100nF 20-80% 50V 0603
2410	3198 017 41050	1µF 10V 0603
2411	2238 586 59812	100nF 20-80% 50V 0603
2412	4822 122 33741	10pF 10% 50V
2413	4822 124 80483	47µF20% 6,3V
2414	2238 586 59812	100nF 20-80% 50V 0603
2416	3198 017 41050	1µF 10V 0603
2417	4822 124 11947	10?F 20% 16V
2418	3198 017 41050	1µF 10V 0603
2419	3198 017 41050	1µF 10V 0603
2420	2238 586 59812	100nF 20-80% 50V 0603
2421	4822 124 11947	10?F 20% 16V
2422	5322 126 11583	10nF 10% 50V 0603
2423	3198 017 41050	1µF 10V 0603
2424	4822 124 80483	47µF20% 6,3V
2425	2238 586 59812	100nF 20-80% 50V 0603
2427	3198 017 41050	1µF 10V 0603
2428	4822 124 11947	10?F 20% 16V
2429	4822 124 11946	22µF 20% 16V
2430	2238 586 59812	100nF 20-80% 50V 0603
2432	4822 124 42234	100µF 20% 6,3V
2433	3198 017 34730	47nF 16V 0603
2434	4822 124 80483	47µF20% 6,3V
2435	2238 586 59812	100nF 20-80% 50V 0603
2436	3198 017 41050	1µF 10V 0603
2437	3198 017 41050	1µF 10V 0603
2438	3198 017 41050	1µF 10V 0603
2439	2238 586 59812	100nF 20-80% 50V 0603
2440	3198 017 41050	1µF 10V 0603
2441	3198 017 41050	1µF 10V 0603
2442	4822 124 11946	22µF 20% 16V
2443	4822 124 42234	100µF 20% 6,3V
2444	4822 126 13881	470pF 5% 50V
2445	4822 126 13881	470pF 5% 50V
2446	3198 017 41050	1µF 10V 0603
2447	4822 126 13881	470pF 5% 50V
2448	4822 126 13881	470pF 5% 50V
2450	2238 586 59812	100nF 20-80% 50V 0603
2459	3198 017 41050	1µF 10V 0603
2460	4822 124 40769	4.7µF 20% 100V
2461	4822 124 40769	4.7µF 20% 100V
2462	4822 124 11947	10?F 20% 16V
2463	4822 124 11947	10?F 20% 16V
2464	4822 124 21732	10µF 20% 25V
2501	3198 017 41050	1µF 10V 0603
2502	2238 586 59812	100nF 20-80% 50V 0603
2503	2238 586 59812	100nF 20-80% 50V 0603
2504	3198 017 41050	1µF 10V 0603
2505	3198 017 41050	1µF 10V 0603
2506	3198 017 41050	1µF 10V 0603
2507	3198 017 41050	1µF 10V 0603
2508	3198 017 41050	1µF 10V 0603
2509	2238 586 59812	100nF 20-80% 50V 0603
2510	4822 124 42234	100µF 20% 6,3V
2511	2020 009 90097	100µF BP 16V 20%
2511	2022 036 00005	10µF 16V 20%
2512	2238 586 59812	100nF 20-80% 50V 0603
2513	2020 552 96807	1µF 10V 0603 X5R
2514	2238 586 59812	100nF 20-80% 50V 0603
2515	2020 552 96807	1µF 10V 0603 X5R
2516	2020 009 90097	100µF BP 16V 20%
2516	2022 036 00005	10µF 16V 20%
2517	5322 126 11578	1nF 10% 50V 0603
2518	2238 586 59812	100nF 20-80% 50V 0603
2519	4822 124 42234	100µF 20% 6,3V
2520	5322 126 11578	1nF 10% 50V 0603
2521	2238 586 59812	100nF 20-80% 50V 0603
2522	2020 009 90097	100µF BP 16V 20%
2522	2022 036 00005	10µF 16V 20%
2523	5322 126 11578	1nF 10% 50V 0603
2524	3198 017 41050	1µF 10V 0603
2525	3198 017 41050	1µF 10V 0603
2526	2020 009 90097	100µF BP 16V 20%
2526	2022 036 00005	10µF 16V 20%
2527	5322 126 11578	1nF 10% 50V 0603
2530	2238 586 59812	100nF 20-80% 50V 0603
2535	2238 586 59812	100nF 20-80% 50V 0603
2536	2238 586 59812	100nF 20-80% 50V 0603
2600	4822 124 21732	10µF 20% 25V
2601	5322 126 11583	10nF 10% 50V 0603
2602	4822 124 21732	10µF 20% 25V
2603	2238 586 59812	100nF 20-80% 50V 0603
2604	5322 126 11583	10nF 10% 50V 0603
2605	4822 124 21732	10µF 20% 25V
2606	2238 586 59812	100nF 20-80% 50V 0603
2607	4822 126 14225	56pF 5% 50V 0603
2608	4822 124 21732	10µF 20% 25V
2609	4822 126 14225	56pF 5% 50V 0603
2610	5322 126 11583	10nF 10% 50V 0603
2611	4822 124 80231	47µF20% 16V
2612	4822 124 40769	4.7µF 20% 100V
2616	5322 126 11578	1nF 10% 50V 0603
2617	5322 126 11578	1nF 10% 50V 0603
2620	3198 016 33380	3.3pF 50V 0603
2621	3198 016 33380	3.3pF 50V 0603
2623	2238 586 59812	100nF 20-80% 50V 0603
2713	4822 124 11946	22µF 20% 16V
2719	4822 126 13883	220pF 5% 50V
2720	4822 124 42234	100µF 20% 6,3V
2721	5322 122 33861	120pF10% 50V
2722	2022 020 00861	2.2µF 50V 20%
2722	5322 124 41379	2.2?F 20% 50V
2723	4822 126 13881	470pF 5% 50V
2724	2238 586 59812	100nF 20-80% 50V 0603
2727	2238 586 59812	100nF 20-80% 50V 0603
2728	5322 126 11583	10nF 10% 50V 0603
2729	4822 124 21732	10µF 20% 25V
2730	4822 126 13879	220nF 20% 16V
2731	2020 552 94523	8.2pF 50V 0603
2732	4822 124 22652	2.2µF 20% 50V
2733	2238 586 59812	100nF 20-80% 50V 0603
2734	5322 126 11578	1nF 10% 50V 0603
2735	4822 126 11669	27pF 5% 50V 0603
2736	4822 126 11669	27pF 5% 50V 0603
2737	4822 124 80483	47µF20% 6,3V
2740	4822 124 22652	2.2µF 20% 50V
2741	5322 126 11578	1nF 10% 50V 0603
2742	5322 126 11578	1nF 10% 50V 0603
2932	2238 586 59812	100nF 20-80% 50V 0603
2933	4822 124 80483	47µF20% 6,3V
2934	2238 586 59812	100nF 20-80% 50V 0603
2935	2238 586 59812	100nF 20-80% 50V 0603
2936	4822 122 33761	22pF 5% 50V
2937	4822 122 33761	22pF 5% 50V
2938	2238 586 59812	100nF 20-80% 50V 0603
2940	2238 586 59812	100nF 20-80% 50V 0603
2941	4822 124 21732	10µF 20% 25V
2942	4822 126 14238	2.2nF 50V 0603
2943	4822 126 14508	180pF 5% 50V
2944	4822 126 14238	2.2nF 50V 0603
2945	4822 126 14508	180pF 5% 50V
2946	3198 017 41050	1µF 10V 0603
2947	3198 017 41050	1µF 10V 0603

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3001	5322 117 13031	5.6kΩ 1% 0603
3004	2120 108 93058	33kΩ 1% 0603
3004	2322 704 63303	33k 1% 0603
3005	4822 051 30472	4.7kΩ 5% 0.062W
3006	4822 051 30472	4.7kΩ 5% 0.062W
3008	2322 704 62703	27kΩ 1% 0603
3009	5322 117 13031	5.6kΩ 1% 0603
3010	5322 117 13053	6.8kΩ 1% 0.063W 0603
3011	4822 117 13632	100kΩ 1% 0603 0.62W
3012	4822 051 30103	10kΩ 5% 0.062W
3013	5322 117 13053	6.8kΩ 1% 0.063W 0603
3014	5322 117 13031	5.6kΩ 1% 0603
3015	4822 051 30471	470Ω 5% 0.062W
3016	2322 704 62703	27kΩ 1% 0603
3017	2120 108 93058	33kΩ 1% 0603
3017	2322 704 63303	33k 1% 0603
3018	5322 117 13031	5.6kΩ 1% 0603
3019	4822 116 52186	22Ω 5% 0.5W
3020	4822 051 30472	4.7kΩ 5% 0.062W
3021	4822 051 30103	10kΩ 5% 0.062W
3022	4822 117 12139	22Ω 5% 0.062W
3023	4822 117 12139	22Ω 5% 0.062W
3024	4822 117 12139	22Ω 5% 0.062W
3025	4822 117 13632	100kΩ 1% 0603 0.62W
3026	4822 117 12139	22Ω 5% 0.062W
3027	2120 108 93058	33kΩ 1% 0603
3027	2322 704 63303	33k 1% 0603
3028	4822 117 12139	22Ω 5% 0.062W
3029	4822 051 30101	100Ω 5% 0.062W
3030	2322 704 62703	27kΩ 1% 0603
3031	4822 051 30103	10kΩ 5% 0.062W
3032	5322 117 13053	6.8kΩ 1% 0.063W 0603
3033	4822 117 12139	22Ω 5% 0.062W
3034	4822 117 13613	2R2 5% 0603
3035	4822 117 13613	2R2 5% 0603
3036	5322 117 13053	6.8kΩ 1% 0.063W 0603
3039	2322 704 62703	27kΩ 1% 0603
3040	2120 108 93058	33kΩ 1% 0603
3040	2322 704 63303	33k 1% 0603
3042	4822 050 21003	10kΩ 1% 0.6W
3043	4822 117 12925	47kΩ 1% 0.063W 0603
3044	4822 117 12925	47kΩ 1% 0.063W 0603
3045	4822 051 30102	1kΩ 5% 0.062W
3047	4822 050 21003	10kΩ 1% 0.6W
3049	4822 051 30472	4.7kΩ 5% 0.062W
3051	4822 117 13632	100kΩ 1% 0603 0.62W
3052	4822 051 30223	22kΩ 5% 0.062W
3053	4822 050 21003	10kΩ 1% 0.6W
3054	4822 117 12139	22Ω 5% 0.062W
3300	4822 053 21335	3.3MΩ 5% 0.5W
3301	4822 053 21335	3.3MΩ 5% 0.5W
3302	4822 051 30102	1kΩ 5% 0.062W
3303	4822 051 30102	1kΩ 5% 0.062W
3304	4822 051 30103	10kΩ 5% 0.062W
3305	4822 053 21684	680kΩ 5% 0,5W
3306	4822 116 83872	220Ω 5% 0.5W
3307	4822 051 30103	10kΩ 5% 0.062W
3308	4822 116 52272	330k 5% 0.5W
3309	4822 116 52272	330k 5% 0.5W
3310	4822 116 52272	330k 5% 0.5W
3311	4822 051 30102	1kΩ 5% 0.062W
3312	4822 051 30221	220Ω 5% 0.062W
3313	4822 116 52234	100kΩ 5% 0,5W
3314	2322 704 61002	1kΩ 0603 RC22H PM1
3314	4822 117 13611	1KΩ 1% 0603 ERJ3E
3315	5322 117 13056	8.2K 1% 0.063W 0603
3316	5322 117 13026	4.7kΩ 1% 0.063W 0603
3317	4822 051 30102	1kΩ 5% 0.062W
3318	4822 116 52175	100Ω 5% 0.5W
3321	2322 193 14477	0.47Ω PR01 PM5
3323	4822 117 12891	220kΩ 1% 0.063W 0603
3324	2322 702 60564	560kΩ 5% 0603
3325	4822 117 12925	47kΩ 1% 0.063W 0603
3326	4822 116 52195	47Ω 5% 0.5W
3327	4822 051 30105	1MΩ 5% 0.062W
3328	4822 051 30103	10kΩ 5% 0.062W
3329	3198 021 32250	2.2MΩ 5% 0603
3330	4822 051 30471	470Ω 5% 0.062W
3331	4822 051 30109	10Ω 5% 0.062W
3332	5322 117 13031	5.6kΩ 1% 0603
3333	5322 117 13026	4.7kΩ 1% 0.063W 0603
3334	4822 051 30563	56kΩ 5% 0.062W
3335	4822 051 30471	470Ω 5% 0.062W
3336	4822 051 30471	470Ω 5% 0.062W
3337	4822 051 30102	1kΩ 5% 0.062W
3338	4822 051 30221	220Ω 5% 0.062W
3339	5322 117 13026	4.7kΩ 1% 0.063W 0603
3340	5322 117 13026	4.7kΩ 1% 0.063W 0603
3341	4822 051 30683	68kΩ 5% 0.062W
3342	4822 116 52283	4.7kΩ 5% 0.5W
3343	5322 117 13026	4.7kΩ 1% 0.063W 0603
3344	4822 117 12925	47kΩ 1% 0.063W 0603
3346	4822 051 30222	2.2kΩ 5% 0.062W
3347	4822 051 30472	4.7kΩ 5% 0.062W
3348	4822 051 30681	680Ω 5% 0.062W
3349	4822 051 30479	47Ω 5% 0.062W
3350	4822 051 30102	1kΩ 5% 0.062W
3351	4822 051 30105	1MΩ 5% 0.062W
3352	2322 193 14687	0.68Ω PR01 PM5
3353	4822 051 30272	2.7kΩ 5% 0.062W
3354	4822 051 30272	2.7kΩ 5% 0.062W
3355	4822 051 30479	47Ω 5% 0.062W
3356	4822 116 52231	820Ω 5% 0.5W

3357	4822 051 30472	4.7kΩ 5% 0.062W
3358	4822 051 30109	10Ω 5% 0.062W
3360	4822 116 52231	820Ω 5% 0.5W
3361	4822 051 30102	1kΩ 5% 0.062W
3362	4822 051 30681	680Ω 5% 0.062W
3363	4822 051 30222	2.2kΩ 5% 0.062W
3364	4822 051 30103	10kΩ 5% 0.062W
3365	4822 051 30332	3.3kΩ 5% 0.062W
3366	4822 051 30152	1.5kΩ 5% 0.062W
3367	4822 117 12903	1.8kΩ 1% 0.063W 0603
3368	4822 051 30152	1.5kΩ 5% 0.062W
3371	4822 051 30479	47Ω 5% 0.062W
3372	4822 051 30339	33Ω 5% 0.062W
3373	4822 051 30339	33Ω 5% 0.062W
3374	4822 051 30471	470Ω 5% 0.062W
3378	4822 051 30152	1.5kΩ 5% 0.062W
3401	5322 117 13055	75R 1% 0.063W 0603
3402	5322 117 13055	75R 1% 0.063W 0603
3403	5322 117 13055	75R 1% 0.063W 0603
3404	4822 051 30759	75Ω 5% 0.062W
3405	4822 051 30223	22kΩ 5% 0.062W
3406	4822 117 12891	220kΩ 1% 0.063W 0603
3407	4822 051 30332	3.3kΩ 5% 0.062W
3408	4822 051 30392	3.9kΩ 5% 0.063W 0603
3409	5322 117 13055	75R 1% 0.063W 0603
3410	5322 117 13055	75R 1% 0.063W 0603
3411	4822 051 30759	75Ω 5% 0.062W
3412	4822 116 52201	75Ω 5% 0.5W
3413	5322 117 13055	75R 1% 0.063W 0603
3414	4822 051 30759	75Ω 5% 0.062W
3415	4822 051 30102	1kΩ 5% 0.062W
3416	4822 051 30472	4.7kΩ 5% 0.062W
3417	4822 051 30759	75Ω 5% 0.062W
3418	4822 117 13632	100kΩ 1% 0603 0.62W
3419	4822 051 30223	22kΩ 5% 0.062W
3420	4822 051 30151	150Ω 5% 0.062W
3421	4822 051 30273	27kΩ 5% 0.062W
3422	4822 116 52231	820Ω 5% 0.5W
3423	4822 051 30391	390Ω 5% 0.062W
3424	4822 051 30333	33kΩ 5% 0.062W
3425	4822 051 30471	470Ω 5% 0.062W
3426	4822 051 30333	33kΩ 5% 0.062W
3427	4822 051 30759	75Ω 5% 0.062W
3428	4822 117 13632	100kΩ 1% 0603 0.62W
3429	4822 117 12925	47kΩ 1% 0.063W 0603
3431	4822 051 30472	4.7kΩ 5% 0.062W
3432	4822 116 52175	100Ω 5% 0.5W
3433	4822 116 52175	100Ω 5% 0.5W
3434	4822 116 52283	4.7kΩ 5% 0.5W
3435	2122 101 02073	82Ω 5% 0,5W
3436	4822 116 52199	68Ω 5% 0.5W
3437	4822 051 30103	10kΩ 5% 0.062W
3438	4822 051 30103	10kΩ 5% 0.062W
3439	4822 051 30103	10kΩ 5% 0.062W
3440	4822 051 30103	10kΩ 5% 0.062W
3441	2122 101 02073	82Ω 5% 0,5W
3442	4822 051 30154	150kΩ 5% 0.062W
3443	4822 117 13632	100kΩ 1% 0603 0.62W
3444	4822 117 13632	100kΩ 1% 0603 0.62W
3445	4822 051 30151	150Ω 5% 0.062W
3446	4822 117 12925	47kΩ 1% 0.063W 0603
3447	4822 116 83884	47kΩ 5% 0.5W
3448	4822 051 30271	270Ω 5% 0.062W
3449	4822 051 30151	150Ω 5% 0.062W
3450	4822 051 30271	270Ω 5% 0.062W
3451	4822 050 21003	10kΩ 1% 0.6W
3452	4822 051 30151	150Ω 5% 0.062W
3454	4822 050 11002	1kΩ 1% 0.4W
3455	4822 051 30103	10kΩ 5% 0.062W
3458	4822 051 30472	4.7kΩ 5% 0.062W
3459	4822 051 30103	10kΩ 5% 0.062W
3460	4822 051 30472	4.7kΩ 5% 0.062W
3461	2122 551 00031	VDR 0805 1mA/6V4 21V
3461	2322 574 10402	VDR 0805 1mA/6V4 21V
3462	2122 551 00031	VDR 0805 1mA/6V4 21V
3462	2322 574 10402	VDR 0805 1mA/6V4 21V
3463	2122 551 00031	VDR 0805 1mA/6V4 21V
3463	2322 574 10402	VDR 0805 1mA/6V4 21V
3464	2122 551 00031	VDR 0805 1mA/6V4 21V
3464	2322 574 10402	VDR 0805 1mA/6V4 21V
3465	2122 551 00031	VDR 0805 1mA/6V4 21V
3465	2322 574 10402	VDR 0805 1mA/6V4 21V
3466	2122 551 00031	VDR 0805 1mA/6V4 21V
3466	2322 574 10402	VDR 0805 1mA/6V4 21V
3467	2122 551 00031	VDR 0805 1mA/6V4 21V
3467	2322 574 10402	VDR 0805 1mA/6V4 21V
3468	2122 551 00031	VDR 0805 1mA/6V4 21V
3468	2322 574 10402	VDR 0805 1mA/6V4 21V
3469	4822 117 13632	100kΩ 1% 0603 0.62W
3470	4822 117 13632	100kΩ 1% 0603 0.62W
3471	4822 117 13632	100kΩ 1% 0603 0.62W
3472	4822 117 13632	100kΩ 1% 0603 0.62W
3475	4822 051 30101	100Ω 5% 0.062W
3476	4822 051 30101	100Ω 5% 0.062W

3477	4822 051 30101	100Ω 5% 0.062W
3478	4822 051 30101	100Ω 5% 0.062W
3487	4822 117 13632	100kΩ 1% 0603 0.62W
3488	4822 117 13632	100kΩ 1% 0603 0.62W
3489	4822 117 12864	82kΩ 5% 0.6W
3490	4822 051 30151	150Ω 5% 0.062W
3491	4822 051 30151	150Ω 5% 0.062W
3492	4822 051 30151	150Ω 5% 0.062W
3493	4822 051 30151	150Ω 5% 0.062W
3494	4822 051 30151	150Ω 5% 0.062W
3495	4822 051 30471	470Ω 5% 0.062W
3496	4822 051 30471	470Ω 5% 0.062W
3501	4822 051 30102	1kΩ 5% 0.062W
3502	4822 050 11002	1kΩ 1% 0.4W
3503	4822 117 13632	100kΩ 1% 0603 0.62W
3504	4822 117 13632	100kΩ 1% 0603 0.62W
3505	4822 117 13632	100kΩ 1% 0603 0.62W
3506	4822 117 13632	100kΩ 1% 0603 0.62W
3507	4822 117 13632	100kΩ 1% 0603 0.62W
3508	4822 051 30102	1kΩ 5% 0.062W
3509	4822 050 11002	1kΩ 1% 0.4W
3510	4822 117 13632	100kΩ 1% 0603 0.62W
3511	4822 117 13632	100kΩ 1% 0603 0.62W
3512	4822 051 30102	1kΩ 5% 0.062W
3513	4822 051 30102	1kΩ 5% 0.062W
3514	4822 117 13632	100kΩ 1% 0603 0.62W
3515	4822 050 11002	1kΩ 1% 0.4W
3516	4822 117 13632	100kΩ 1% 0603 0.62W
3517	4822 116 52283	4.7kΩ 5% 0.5W
3518	4822 051 30102	1kΩ 5% 0.062W
3519	4822 116 52283	4.7kΩ 5% 0.5W
3520	4822 051 30221	220Ω 5% 0.062W
3521	4822 051 30221	220Ω 5% 0.062W
3522	4822 051 30221	220Ω 5% 0.062W
3523	4822 050 11002	1kΩ 1% 0.4W
3524	4822 117 12968	820Ω 5% 0.62W
3525	4822 051 30221	220Ω 5% 0.062W
3526	4822 051 30102	1kΩ 5% 0.062W
3527	4822 117 12968	820Ω 5% 0.62W
3528	4822 051 30472	4.7kΩ 5% 0.062W
3529	4822 051 30472	4.7kΩ 5% 0.062W
3530	4822 117 12968	820Ω 5% 0.62W
3531	4822 117 12968	820Ω 5% 0.62W
3532	4822 050 11002	1kΩ 1% 0.4W
3533	4822 050 11002	1kΩ 1% 0.4W
3534	4822 117 13632	100kΩ 1% 0603 0.62W
3600	4822 051 30103	10kΩ 5% 0.062W
3601	4822 116 52175	100Ω 5% 0.5W
3602	4822 051 30472	4.7kΩ 5% 0.062W
3603	4822 116 52175	100Ω 5% 0.5W
3611	4822 051 30101	100Ω 5% 0.062W
3612	4822 051 30101	100Ω 5% 0.062W
3701	4822 116 52228	680Ω 5% 0.5W
3702	4822 051 30471	470Ω 5% 0.062W
3703	4822 116 52245	150kΩ 5% 0.5W
3704	4822 051 30221	220Ω 5% 0.062W
3705	4822 051 30103	10kΩ 5% 0.062W
3710	4822 051 30562	5.6kΩ 5% 0.063W 0603
3711	4822 051 30333	33kΩ 5% 0.062W
3714	4822 051 30183	18kΩ 5% 0.062W
3715	4822 051 30103	10kΩ 5% 0.062W
3716	4822 051 30472	4.7kΩ 5% 0.062W
3717	4822 051 30472	4.7kΩ 5% 0.062W
3720	4822 051 30331	330Ω 5% 0.062W
3724	4822 100 12158	22K 30%
3725	5322 117 13056	8.2K 1% 0.063W 0603
3726	4822 051 30101	100Ω 5% 0.062W
3728	4822 051 30101	100Ω 5% 0.062W
3730	4822 051 30472	4.7kΩ 5% 0.062W
3731	4822 051 30271	270Ω 5% 0.062W
3732	4822 051 30102	1kΩ 5% 0.062W
3733	4822 051 30472	4.7kΩ 5% 0.062W
3734	4822 051 30272	2.7kΩ 5% 0.062W
3735	4822 051 30332	3.3kΩ 5% 0.062W
3736	4822 051 30331	330Ω 5% 0.062W
3737	4822 051 30222	2.2kΩ 5% 0.062W
3738	4822 051 30682	6.8kΩ 5% 0.062W
3739	4822 051 30562	5.6kΩ 5% 0.063W 0603
3740	4822 051 30681	680Ω 5% 0.062W
3741	4822 051 30472	4.7kΩ 5% 0.062W
3742	4822 051 30472	4.7kΩ 5% 0.062W
3743	4822 051 30563	56kΩ 5% 0.062W
3744	4822 117 13632	100kΩ 1% 0603 0.62W
3745	4822 051 30562	5.6kΩ 5% 0.063W 0603
3746	4822 051 30562	5.6kΩ 5% 0.063W 0603
3758	4822 051 30103	10kΩ 5% 0.062W
3931	4822 117 12925	47kΩ 1% 0.063W 0603
3932	4822 117 12925	47kΩ 1% 0.063W 0603
3933	4822 117 12925	47kΩ 1% 0.063W 0603
3934	4822 051 30101	100Ω 5% 0.062W
3935	4822 051 30101	100Ω 5% 0.062W
3936	4822 051 30103	10kΩ 5% 0.062W
3937	4822 051 30222	2.2kΩ 5% 0.062W
3938	4822 051 30222	2.2kΩ 5% 0.062W

3939	4822 051 30472	4.7kΩ 5% 0.062W
3940	3198 021 31060	10MΩ 5% 0.062W 0603
3941	3198 021 31060	10MΩ 5% 0.062W 0603
3942	4822 051 30333	33kΩ 5% 0.062W
3943	4822 051 30333	33kΩ 5% 0.062W
3944	4822 051 30333	33kΩ 5% 0.062W
3945	4822 051 30333	33kΩ 5% 0.062W
3946	4822 051 30333	33kΩ 5% 0.062W
3947	4822 051 30333	33kΩ 5% 0.062W
3948	4822 051 30472	4.7kΩ 5% 0.062W
3950	4822 117 13632	100kΩ 1% 0603 0.62W
3951	4822 051 30223	22kΩ 5% 0.062W
3952	4822 051 30153	15kΩ 5% 0.062W
3953	4822 051 30472	4.7kΩ 5% 0.062W
3954	4822 051 30472	4.7kΩ 5% 0.062W
3955	4822 051 30103	10kΩ 5% 0.062W
4001	4822 051 30008	Jumper 0603
4002	4822 051 30008	Jumper 0603
4003	4822 051 30008	Jumper 0603
4402	4822 051 30008	Jumper 0603
4411	4822 051 30008	Jumper 0603
4412	4822 051 30008	Jumper 0603
4413	4822 051 30008	Jumper 0603
4414	4822 051 30008	Jumper 0603
4415	4822 051 30008	Jumper 0603
4416	4822 051 30008	Jumper 0603
4417	4822 051 30008	Jumper 0603
4418	4822 051 30008	Jumper 0603
4419	4822 051 30008	Jumper 0603
4420	4822 051 30008	Jumper 0603
4421	4822 051 30008	Jumper 0603
4422	4822 051 30008	Jumper 0603
4423	4822 051 30008	Jumper 0603
4424	4822 051 30008	Jumper 0603
4425	4822 051 30008	Jumper 0603
4426	4822 051 30008	Jumper 0603
4428	4822 051 30008	Jumper 0603
4429	4822 051 30008	Jumper 0603
4430	4822 051 30008	Jumper 0603
4431	4822 051 30008	Jumper 0603
4433	4822 051 30008	Jumper 0603
4434	4822 051 30008	Jumper 0603
4435	4822 051 30008	Jumper 0603
4437	4822 051 30008	Jumper 0603
4442	4822 051 30008	Jumper 0603
4443	4822 051 30008	Jumper 0603
4444	4822 051 30008	Jumper 0603
4446	4822 051 30008	Jumper 0603
4447	4822 051 30008	Jumper 0603
4448	4822 051 30008	Jumper 0603
4449	4822 051 30008	Jumper 0603
4452	4822 051 30008	Jumper 0603
4453	4822 051 30008	Jumper 0603
4454	4822 051 30008	Jumper 0603
4455	4822 051 30008	Jumper 0603
4459	4822 051 30008	Jumper 0603
4460	4822 051 10008	Jumper 1206
4461	4822 051 30008	Jumper 0603
4601	4822 051 30008	Jumper 0603
4999	4822 051 30008	Jumper 0603

5001	2422 549 43062	Bead 600Ω at 100MHz
5002	2422 549 43062	Bead 600Ω at 100MHz
5300	2422 531 02546	TFM SMT SLOT SRW28EC9-E01V0*
5301	4822 157 51195	1 UH 20% 4X9,8MM
5302	2422 549 44509	25MH 0A4 HF2022R
5304	4822 157 70826	2.4µH
5305	4822 157 70826	2.4µH
5306	2422 535 94634	2.2µH LHL08 20%
5307	4822 157 11737	22µH 10%
5308	4822 157 11737	22µH 10%
5309	4822 157 11737	22µH 10%
5401	4822 157 11706	10µH 5%
5402	4822 157 11706	10µH 5%
5403	4822 157 11706	10µH 5%
5404	4822 157 11706	10µH 5%
5405	2422 549 43062	Bead 600Ω at 100MHz
5406	4822 157 11706	10µH 5%
5407	2422 549 43062	Bead 600Ω at 100MHz
5600	4822 157 11706	10µH 5%
5601	4822 157 11706	10µH 5%
5602	4822 157 11706	10µH 5%
5701	2422 549 43062	Bead 600Ω at 100MHz
5702	2422 549 43062	Bead 600Ω at 100MHz
5705	4822 157 11139	6.8µH 5%
5709	4822 157 11139	6.8µH 5%
5710	2422 549 44162	IND VAR 7MM 7KMY 77M8
5711	2422 549 45833	7MM 7KLY 77MHZ8
5713	4822 157 11747	15UH 5%
5714	4822 157 11747	15UH 5%

5931	4822 157 11706	10µH 5%
5932	2422 549 43062	Bead 600Ω at 100MHz

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6003	4822 130 30621	1N4148
6004	4822 130 30621	1N4148
6005	4822 130 11397	BAS316
6300	9322 161 76682	SB340L-7024
6301	4822 130 31603	1N4006
6302	4822 130 31603	1N4006
6303	9322 161 76682	SB340L-7024
6305	4822 130 31603	1N4006
6306	4822 130 31603	1N4006
6307	4822 130 82627	SB540
6307	9322 184 68682	STPS5L40-C2
6308	4822 130 82627	SB540
6308	9322 184 68682	STPS5L40-C2
6309	9322 126 71673	BYT42M
6310	9322 161 78682	SB360L-7024
6311	4822 130 31878	1N4003G
6312	4822 130 11416	PDZ6.8B
6313	4822 130 10871	SBYV27-200
6314	4822 130 10837	UDZS8.2B
6315	4822 130 11397	BAS316
6316	4822 130 30842	BAV21
6317	4822 130 41601	BYV95A
6317	9322 126 71673	BYT42M
6318	4822 130 34142	BZX79-B33
6319	4822 130 41601	BYV95A
6319	9322 126 71673	BYT42M
6320	4822 130 11397	BAS316
6321	4822 130 10654	BAT254
6321	9322 199 12685	BAT54WS
6322	4822 130 11416	PDZ6.8B
6324	9340 548 69115	PDZ27B
6325	4822 130 81234	1N5819
6401	9340 548 61115	PDZ12B
6402	9340 548 61115	PDZ12B
6403	9340 548 61115	PDZ12B
6404	9340 548 61115	PDZ12B
6409	4822 130 11416	PDZ6.8B
6414	4822 130 11416	PDZ6.8B
6415	9340 548 61115	PDZ12B
6416	9340 548 61115	PDZ12B
6417	9340 548 61115	PDZ12B
6418	9340 548 61115	PDZ12B
6419	9340 548 61115	PDZ12B
6420	9340 548 61115	PDZ12B
6422	4822 130 11564	UDZ3.9B
6423	9340 548 61115	PDZ12B
6424	9340 548 61115	PDZ12B
6425	9340 548 61115	PDZ12B
6426	9340 548 61115	PDZ12B
6427	9340 548 61115	PDZ12B
6428	4822 130 11522	UDZ15B
6429	4822 130 11522	UDZ15B
6600	4822 130 11397	BAS316
6703	9340 552 30115	BA591
6704	9340 552 30115	BA591
6705	9340 552 30115	BA591

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7001	4822 130 60854	DTA124EU-W
7003	4822 209 62312	MC33078D
7004	9322 148 78668	AD1852JRS
7005	3198 010 42310	BC847BW
7006	3198 010 42310	BC847BW
7007	9352 670 99118	UDA1361TS/N1
7008	3198 010 42320	BC857BW
7009	3198 010 42320	BC857BW
7010	4822 130 61553	DTC124EU
7301	4822 209 14933	TL431IZ
7302	4822 130 11336	STP16NE06FP
7303	9322 160 70668	SI4936ADY
7303	9322 183 38668	STS9NF30L
7304	4822 209 14933	TL431IZ
7305	4822 209 14933	TL431IZ
7306	4822 130 61553	DTC124EU
7307	9322 157 37687	STP3NC60FP
7308	4822 130 61553	DTC124EU
7309	9322 180 12685	SI2312DS
7310	3198 010 42310	BC847BW
7311	3198 010 42310	BC847BW
7312	4822 130 41782	BF422
7313	9352 673 56112	TEA1507P/N1
7314	9322 153 43682	LTV817BM-V
7314	9965 000 09548	TCET1108G
7315	4822 209 14933	TL431IZ
7317	9322 191 71687	STD17NF03L-1
7318	9322 163 75685	SI2306DS
7319	5322 130 60159	BC846B
7320	9322 163 75685	SI2306DS
7321	4822 130 61553	DTC124EU
7322	3198 010 42320	BC857BW
7401	3198 010 42320	BC857BW
7402	3198 010 42310	BC847BW
7403	3198 010 42320	BC857BW
7404	3198 010 42320	BC857BW
7405	3198 010 42310	BC847BW
7406	3198 010 42320	BC857BW
7407	3198 010 42310	BC847BW
7408	9322 173 41668	ST6618
7409	3198 010 42310	BC847BW
7410	9322 174 76668	NJM2267M
7411	9322 179 71668	NJM2285M
7412	4822 130 61553	DTC124EU
7415	9340 219 30115	BC817-25W
7416	9340 219 30115	BC817-25W
7419	9340 560 36235	BSH111
7420	9340 560 36235	BSH111
7421	3198 010 42310	BC847BW
7501	5322 209 11102	HEF4052BT
7502	4822 209 32071	MC33079D
7503	5322 209 11102	HEF4052BT
7504	5322 209 11102	HEF4052BT
7505	4822 209 62312	MC33078D
7506	9340 219 30115	BC817-25W
7508	9340 219 30115	BC817-25W
7509	9340 219 30115	BC817-25W
7511	9340 219 30115	BC817-25W
7600	9322 186 87668	MSP3415G-QG-B8V3
7701	4822 130 61553	DTC124EU
7702	4822 130 61553	DTC124EU
7704	4822 130 61553	DTC124EU
7705	4822 130 61553	DTC124EU
7706	4822 130 61553	DTC124EU
7710	9352 606 11118	TDA9818T/V1
7711	3198 010 42320	BC857BW
7712	4822 130 61553	DTC124EU
7713	3198 010 42320	BC857BW
7714	3198 010 42310	BC847BW
7716	3198 010 42320	BC857BW
7717	3198 010 42310	BC847BW
7931	4822 209 17505	STV5348D
7932	3198 010 42310	BC847BW
7933	3198 010 42310	BC847BW
7934	4822 209 60177	LM339D

Up Sub Board

Various

1801	2422 543 01115	24.576MHz 12P QS06
1801	2422 543 01368	24M576 12P CX8045
1805	4822 242 70938	TA252E00 (32,768KHZ)
1901	2422 025 12488	CON BM H 2P M 2.50 EH B
1980	2422 025 17723	CON BM V 8P M
1980	2422 025 18217	CON V 8P M 2.00
1984	2422 025 17723	CON BM V 8P M
1984	2422 025 18217	CON V 8P M 2.00
1986	2422 025 16677	Connector 10P
1987	2422 025 17723	CON BM V 8P M
1987	2422 025 18217	CON V 8P M 2.00
1988	2422 025 17723	CON BM V 8P M
1988	2422 025 18217	CON V 8P M 2.00

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2800	2238 586 59812	100nF 20-80% 50V 0603
2801	4822 122 33752	15pF 5% 50V
2802	4822 122 33752	15pF 5% 50V
2803	2238 586 59812	100nF 20-80% 50V 0603
2804	2238 586 59812	100nF 20-80% 50V 0603
2805	2238 586 59812	100nF 20-80% 50V 0603
2806	2238 586 59812	100nF 20-80% 50V 0603
2807	4822 126 13879	220nF 20% 16V
2808	2238 586 59812	100nF 20-80% 50V 0603
2809	2238 586 59812	100nF 20-80% 50V 0603
2810	4822 122 33741	10pF 10% 50V
2811	4822 122 33741	10pF 10% 50V
2812	5322 126 11583	10nF 10% 50V 0603
2813	4822 122 33741	10pF 10% 50V
2814	4822 122 33741	10pF 10% 50V
2815	4822 126 13883	220pF 5% 50V
2816	4822 124 11968	220mF +80-20% 5,5V
2817	2238 586 59812	100nF 20-80% 50V 0603
2818	4822 126 13883	220pF 5% 50V
2819	4822 124 42234	100µF 20% 6,3V
2820	5322 126 11583	10nF 10% 50V 0603
2821	5322 126 11583	10nF 10% 50V 0603
2822	2238 586 59812	100nF 20-80% 50V 0603
2823	5322 126 11578	1nF 10% 50V 0603
2824	3198 017 41050	1µF 10V 0603
2825	2020 552 94427	100pF 5% 50v 0603
2828	2238 586 59812	100nF 20-80% 50V 0603
2829	4822 124 21732	10µF 20% 25V
2830	2238 586 59812	100nF 20-80% 50V 0603
2831	5322 126 11583	10nF 10% 50V 0603
2912	4822 124 23052	100UF20% 16V
2913	4822 124 23052	100UF20% 16V

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3800	4822 051 30101	100Ω 5% 0.062W
3801	4822 051 30103	10kΩ 5% 0.062W
3802	4822 051 30101	100Ω 5% 0.062W
3803	4822 051 30102	1kΩ 5% 0.062W
3804	4822 051 30103	10kΩ 5% 0.062W
3805	4822 051 30101	100Ω 5% 0.062W
3806	4822 051 30223	22kΩ 5% 0.062W
3807	4822 117 13632	100kΩ 1% 0603 0.62W
3808	4822 117 13632	100kΩ 1% 0603 0.62W
3809	4822 117 13632	100kΩ 1% 0603 0.62W
3810	4822 117 13632	100kΩ 1% 0603 0.62W
3811	4822 051 30101	100Ω 5% 0.062W
3812	4822 051 30223	22kΩ 5% 0.062W
3813	4822 051 30103	10kΩ 5% 0.062W
3814	4822 051 30103	10kΩ 5% 0.062W
3815	4822 051 30183	18kΩ 5% 0.062W
3816	4822 051 30103	10kΩ 5% 0.062W
3817	4822 051 30222	2.2kΩ 5% 0.062W
3818	4822 051 30472	4.7kΩ 5% 0.062W
3819	4822 051 30103	10kΩ 5% 0.062W
3820	4822 051 30102	1kΩ 5% 0.062W
3821	4822 051 30103	10kΩ 5% 0.062W
3822	4822 051 30103	10kΩ 5% 0.062W
3823	4822 117 13632	100kΩ 1% 0603 0.62W
3824	4822 051 30102	1kΩ 5% 0.062W
3825	4822 051 30103	10kΩ 5% 0.062W
3826	4822 051 30102	1kΩ 5% 0.062W
3827	4822 051 30102	1kΩ 5% 0.062W
3828	4822 051 30103	10kΩ 5% 0.062W
3829	4822 051 30103	10kΩ 5% 0.062W
3830	4822 051 30102	1kΩ 5% 0.062W
3831	4822 051 30102	1kΩ 5% 0.062W
3832	4822 051 30333	33kΩ 5% 0.062W
3833	4822 051 30102	1kΩ 5% 0.062W
3834	4822 051 30102	1kΩ 5% 0.062W
3835	4822 051 30102	1kΩ 5% 0.062W
3836	4822 051 30101	100Ω 5% 0.062W
3837	4822 051 30123	12kΩ 5% 0.062W
3838	4822 051 30102	1kΩ 5% 0.062W
3839	4822 051 30273	27kΩ 5% 0.062W
3840	4822 051 30472	4.7kΩ 5% 0.062W
3841	4822 117 13632	100kΩ 1% 0603 0.62W
3842	4822 117 12891	220kΩ 1% 0.063W 0603
3843	4822 051 30333	33kΩ 5% 0.062W
3844	4822 051 30221	220Ω 5% 0.062W
3845	4822 051 30102	1kΩ 5% 0.062W
3846	4822 051 30333	33kΩ 5% 0.062W
3847	4822 051 30103	10kΩ 5% 0.062W
3849	4822 117 12925	47kΩ 1% 0.063W 0603
3850	4822 051 30183	18kΩ 5% 0.062W
3851	4822 051 30103	10kΩ 5% 0.062W
3852	4822 051 30103	10kΩ 5% 0.062W
3854	4822 051 30102	1kΩ 5% 0.062W
3855	4822 051 30471	470Ω 5% 0.062W
3856	4822 051 30103	10kΩ 5% 0.062W
3857	4822 051 30103	10kΩ 5% 0.062W
3858	4822 117 13632	100kΩ 1% 0603 0.62W
3860	4822 051 30222	2.2kΩ 5% 0.062W
3861	3198 021 32250	2.2MΩ 5% 0603
3862	4822 051 30103	10kΩ 5% 0.062W
3863	4822 117 13608	4.7Ω 5% 0603 0.62W
3864	4822 117 13608	4.7Ω 5% 0603 0.62W
3865	4822 117 13608	4.7Ω 5% 0603 0.62W
3866	4822 117 13608	4.7Ω 5% 0603 0.62W
3867	4822 051 30759	75Ω 5% 0.062W
3868	4822 051 30103	10kΩ 5% 0.062W
3869	4822 051 30331	330Ω 5% 0.062W
3870	4822 117 13632	100kΩ 1% 0603 0.62W
3871	4822 051 30103	10kΩ 5% 0.062W
3872	4822 051 30103	10kΩ 5% 0.062W
3873	4822 051 30472	4.7kΩ 5% 0.062W
3874	4822 051 30103	10kΩ 5% 0.062W
3875	4822 051 30103	10kΩ 5% 0.062W
3876	4822 051 30103	10kΩ 5% 0.062W
3878	4822 051 30102	1kΩ 5% 0.062W
3879	4822 051 30102	1kΩ 5% 0.062W
3881	4822 117 12925	47kΩ 1% 0.063W 0603
3882	4822 117 12925	47kΩ 1% 0.063W 0603
3884	4822 051 30101	100Ω 5% 0.062W
3885	4822 051 30101	100Ω 5% 0.062W
3886	4822 051 30472	4.7kΩ 5% 0.062W

3887	4822 051 30472	4.7kΩ 5% 0.062W
3888	4822 051 30471	470Ω 5% 0.062W
3889	4822 051 30183	18kΩ 5% 0.062W
3913	4822 051 30102	1kΩ 5% 0.062W
3914	4822 051 30102	1kΩ 5% 0.062W
3915	4822 051 30102	1kΩ 5% 0.062W
3916	4822 051 30273	27kΩ 5% 0.062W
3917	2322 704 63603	36kΩ 0603 RC22H 1%
3918	4822 051 30102	1kΩ 5% 0.062W
3919	2120 108 93058	33kΩ 1% 0603
3920	4822 051 30562	5.6kΩ 5% 0.063W 0603
3921	4822 051 30471	470Ω 5% 0.062W
3922	4822 051 30102	1kΩ 5% 0.062W
3923	4822 051 30103	10kΩ 5% 0.062W
3924	4822 051 30103	10kΩ 5% 0.062W
3925	4822 117 12706	10kΩ 1% 0.063W 0603
3926	4822 051 30472	4.7kΩ 5% 0.062W
3927	4822 051 30333	33kΩ 5% 0.062W
3929	4822 051 30008	Jumper 0603
3931	4822 051 30008	Jumper 0603
3933	4822 051 30008	Jumper 0603
4901	4822 051 30008	Jumper 0603
4904	4822 051 10008	Jumper 1206

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5801	2422 549 44607	Bead 600Ω at 100MHz
5802	2422 549 44607	Bead 600Ω at 100MHz
5803	2422 549 44607	Bead 600Ω at 100MHz
5804	2422 549 44607	Bead 600Ω at 100MHz

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6800	4822 130 11397	BAS316
6801	4822 130 11564	UDZ3.9B
6802	4822 130 10654	BAT254
6803	4822 130 10654	BAT254
6804	4822 130 10654	BAT254
6805	4822 130 10654	BAT254
6901	5322 130 34331	BAV70
6903	5322 130 34331	BAV70

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7801	9352 190 00118	74LVC573AD
7802	4822 130 61553	DTC124EU
7803	9322 186 16668	CY62128VLL-70SC
7804	3103 165 13721	TMP91CW12AF/LIRP1
7805	9965 000 17112	M29W800DT-70N6/ AN130067
7806	9322 163 26685	NCP301LSN30
7807	4822 209 73852	PMBT2369
7808	4822 209 16907	M24C16-MN6T
7813	3198 010 42310	BC847BW
7814	3198 010 42310	BC847BW
7815	3198 010 42310	BC847BW
7816	3198 010 42310	BC847BW
7817	3198 010 42310	BC847BW
7818	4822 130 60854	DTA124EU-W
7821	9340 560 36235	BSH111
7822	9340 560 36235	BSH111
7825	9322 181 92682	LA7213
7902	4822 209 63709	LM324D
7903	4822 130 61553	DTC124EU
7904	4822 130 60854	DTA124EU-W
7905	4822 130 61553	DTC124EU
7906	4822 130 61553	DTC124EU
7907	4822 130 61553	DTC124EU
7908	4822 130 61553	DTC124EU
7909	4822 130 41087	BC638
7910	4822 130 61553	DTC124EU

Digital Board

Various

1001	2422 543 01422	24M576 18P CX8045
1102	2422 025 18185	CON V 40P M 2.54
1103	2422 025 17104	Connector 7p m
1104	2422 025 16729	Connector FFC 10p m
1201	2422 543 01115	24.576MHz 12P QS06
1201	2422 543 01368	24M576 12P CX8045
1203	2422 025 17955	CON V 6P M
1400	2422 025 18219	CON 28P M
1500	2422 025 17441	CON BM V 12P M
1505	2422 086 11087	FUSE F 1A 125V
1506	2422 086 11087	FUSE F 1A 125V
1507	2422 086 11087	FUSE F 1A 125V
1704	2422 025 16794	CON BM V 7P F
1900	2422 025 16389	CON V 22P F
1901	2422 025 16987	CON V 6P F
1904	2422 025 16389	CON V 22P F

⊣⊢

2014	4822 124 80151	47µF 20% 16V
2015	2238 586 59812	100nF 20-80% 50V 0603
2016	2238 586 59812	100nF 20-80% 50V 0603
2017	2238 586 59812	100nF 20-80% 50V 0603
2018	2238 586 59812	100nF 20-80% 50V 0603
2019	2238 586 59812	100nF 20-80% 50V 0603
2020	2238 586 59812	100nF 20-80% 50V 0603
2021	2238 586 59812	100nF 20-80% 50V 0603
2022	2020 021 91729	4.7µF 20% 35V
2026	2238 586 59812	100nF 20-80% 50V 0603
2027	2238 586 59812	100nF 20-80% 50V 0603
2028	2238 586 59812	100nF 20-80% 50V 0603
2029	2238 586 59812	100nF 20-80% 50V 0603
2030	2238 586 59812	100nF 20-80% 50V 0603
2031	2238 586 59812	100nF 20-80% 50V 0603
2032	2238 586 59812	100nF 20-80% 50V 0603
2033	2020 021 91729	4.7µF 20% 35V
2035	2238 586 59812	100nF 20-80% 50V 0603
2036	4822 126 14506	270pF 5% 50V 0603
2037	2238 586 59812	100nF 20-80% 50V 0603
2038	2238 586 59812	100nF 20-80% 50V 0603
2039	2238 586 59812	100nF 20-80% 50V 0603
2040	2238 586 59812	100nF 20-80% 50V 0603
2041	2238 586 59812	100nF 20-80% 50V 0603
2042	2238 586 59812	100nF 20-80% 50V 0603
2043	2238 586 59812	100nF 20-80% 50V 0603
2044	2020 021 91729	4.7µF 20% 35V
2046	4822 122 33761	22pF 5% 50V
2048	3198 016 31510	150pF 10% 50V 0603
2049	2020 021 91729	4.7µF 20% 35V
2050	2238 586 59812	100nF 20-80% 50V 0603
2052	2238 586 59812	100nF 20-80% 50V 0603
2053	2238 586 59812	100nF 20-80% 50V 0603
2054	2238 586 59812	100nF 20-80% 50V 0603
2056	2238 586 59812	100nF 20-80% 50V 0603
2058	2238 586 59812	100nF 20-80% 50V 0603
2059	2222 867 15339	33pF 5% 50V 0603
2060	2222 867 15339	33pF 5% 50V 0603
2061	2238 586 59812	100nF 20-80% 50V 0603
2063	2238 586 59812	100nF 20-80% 50V 0603
2064	2238 586 59812	100nF 20-80% 50V 0603
2065	2238 586 59812	100nF 20-80% 50V 0603
2066	3198 016 31020	1nF 10% 25V 0603
2067	2238 586 59812	100nF 20-80% 50V 0603
2071	2238 586 59812	100nF 20-80% 50V 0603
2101	2238 916 15641	22nF 10% 25V 0603
2103	2238 586 59812	100nF 20-80% 50V 0603
2108	4822 126 14585	100nF 10% 50V
2112	4822 126 14247	1.5nF 50V 0603
2113	4822 126 13881	470pF 5% 50V
2114	2238 586 59812	100nF 20-80% 50V 0603
2119	4822 126 14247	1.5nF 50V 0603
2120	2238 586 59812	100nF 20-80% 50V 0603
2125	2238 586 59812	100nF 20-80% 50V 0603
2129	4822 126 13881	470pF 5% 50V
2200	3198 017 41050	1µF 10V 0603
2201	4822 126 14506	270pF 5% 50V 0603
2202	4822 126 11663	12pF 5% 50V 0603
2203	4822 126 11663	12pF 5% 50V 0603
2206	2238 586 59812	100nF 20-80% 50V 0603
2207	2238 586 59812	100nF 20-80% 50V 0603
2209	2238 586 59812	100nF 20-80% 50V 0603
2210	2238 586 59812	100nF 20-80% 50V 0603
2212	4822 124 12095	100µF 20% 16V
2214	2238 586 59812	100nF 20-80% 50V 0603
2215	2238 586 59812	100nF 20-80% 50V 0603
2217	2238 586 59812	100nF 20-80% 50V 0603
2218	2238 586 59812	100nF 20-80% 50V 0603
2219	2238 586 59812	100nF 20-80% 50V 0603
2220	2238 586 59812	100nF 20-80% 50V 0603
2221	2238 586 59812	100nF 20-80% 50V 0603
2222	2238 586 59812	100nF 20-80% 50V 0603
2223	2238 586 59812	100nF 20-80% 50V 0603
2224	2238 586 59812	100nF 20-80% 50V 0603
2225	2238 586 59812	100nF 20-80% 50V 0603
2226	2238 586 59812	100nF 20-80% 50V 0603
2227	2238 586 59812	100nF 20-80% 50V 0603
2228	2238 586 59812	100nF 20-80% 50V 0603
2229	2238 586 59812	100nF 20-80% 50V 0603
2230	2238 586 59812	100nF 20-80% 50V 0603
2231	2238 586 59812	100nF 20-80% 50V 0603
2232	2238 586 59812	100nF 20-80% 50V 0603
2233	2238 586 59812	100nF 20-80% 50V 0603
2234	2238 586 59812	100nF 20-80% 50V 0603
2235	3198 016 31020	1nF 10% 25V 0603
2236	2020 021 91729	4.7µF 20% 35V
2237	2238 586 59812	100nF 20-80% 50V 0603
2238	2238 586 59812	100nF 20-80% 50V 0603
2308	2238 586 59812	100nF 20-80% 50V 0603
2310	2238 586 59812	100nF 20-80% 50V 0603
2403	2238 586 59812	100nF 20-80% 50V 0603
2404	4822 124 23002	10µF 20% 16V
2405	2238 586 59812	100nF 20-80% 50V 0603
2406	2238 586 59812	100nF 20-80% 50V 0603
2407	2238 586 59812	100nF 20-80% 50V 0603
2408	4822 124 23002	10µF 20% 16V
2409	2238 586 59812	100nF 20-80% 50V 0603
2410	2238 586 59812	100nF 20-80% 50V 0603
2411	2238 586 59812	100nF 20-80% 50V 0603
2412	2238 586 59812	100nF 20-80% 50V 0603
2413	2238 586 59812	100nF 20-80% 50V 0603
2414	2238 586 59812	100nF 20-80% 50V 0603
2415	2238 586 59812	100nF 20-80% 50V 0603
2416	2238 586 59812	100nF 20-80% 50V 0603
2417	2238 586 59812	100nF 20-80% 50V 0603
2418	4822 124 23002	10µF 20% 16V
2419	2238 586 59812	100nF 20-80% 50V 0603
2420	4822 124 23002	10µF 20% 16V
2421	2238 586 59812	100nF 20-80% 50V 0603
2422	2238 586 59812	100nF 20-80% 50V 0603
2423	2238 586 59812	100nF 20-80% 50V 0603
2424	2238 586 59812	100nF 20-80% 50V 0603
2425	2238 586 59812	100nF 20-80% 50V 0603
2426	2238 586 59812	100nF 20-80% 50V 0603
2427	2238 586 59812	100nF 20-80% 50V 0603
2428	2238 586 59812	100nF 20-80% 50V 0603
2429	2238 586 59812	100nF 20-80% 50V 0603
2433	2238 586 59812	100nF 20-80% 50V 0603
2436	2222 867 15339	33pF 5% 50V 0603
2512	2020 021 91672	100µF 6V3 20%
2512	2020 021 91857	100µF 6V3 20%
2514	2238 586 59812	100nF 20-80% 50V 0603
2515	3198 017 44740	470nF 10V 0603
2516	2020 021 91672	100µF 6V3 20%
2518	2020 552 94427	100pF 5% 50v 0603
2519	2238 586 59812	100nF 20-80% 50V 0603
2521	2238 586 59812	100nF 20-80% 50V 0603
2524	2238 586 59812	100nF 20-80% 50V 0603
2525	2238 586 59812	100nF 20-80% 50V 0603
2526	2238 586 59812	100nF 20-80% 50V 0603
2527	5322 126 11583	10nF 10% 50V 0603
2700	2020 021 91729	4.7µF 20% 35V
2701	2238 586 59812	100nF 20-80% 50V 0603
2703	3198 016 31020	1nF 10% 25V 0603
2704	2238 586 59812	100nF 20-80% 50V 0603
2705	2238 586 59812	100nF 20-80% 50V 0603
2706	2238 586 59812	100nF 20-80% 50V 0603
2707	2238 586 59812	100nF 20-80% 50V 0603
2709	4822 126 13956	68pF 5% 63V 0603
2710	4822 126 14507	18pF 5% 50V 0603
2712	2238 586 59812	100nF 20-80% 50V 0603
2715	4822 126 13956	68pF 5% 63V 0603
2716	4822 126 14507	18pF 5% 50V 0603
2720	4822 126 13956	68pF 5% 63V 0603
2721	4822 126 14507	18pF 5% 50V 0603
2723	2238 586 59812	100nF 20-80% 50V 0603
2725	2238 586 59812	100nF 20-80% 50V 0603
2726	2238 586 59812	100nF 20-80% 50V 0603
2727	2238 586 59812	100nF 20-80% 50V 0603
2728	2020 021 91729	4.7µF 20% 35V
2729	2020 021 91729	4.7µF 20% 35V
2730	2238 586 59812	100nF 20-80% 50V 0603
2731	2020 021 91729	4.7µF 20% 35V
2732	2238 586 59812	100nF 20-80% 50V 0603
2733	2238 586 15631	3.9nF 0603 X7R 50V 10%
2734	3198 016 38210	820pF 25V
2806	2238 586 59812	100nF 20-80% 50V 0603
2807	2238 586 59812	100nF 20-80% 50V 0603
2808	2238 586 59812	100nF 20-80% 50V 0603
2809	2238 586 59812	100nF 20-80% 50V 0603
2810	2238 586 59812	100nF 20-80% 50V 0603
2811	2238 586 59812	100nF 20-80% 50V 0603
2812	2238 586 59812	100nF 20-80% 50V 0603
2820	2238 586 59812	100nF 20-80% 50V 0603
2821	2238 586 59812	100nF 20-80% 50V 0603
2822	2238 586 59812	100nF 20-80% 50V 0603
2823	2238 586 59812	100nF 20-80% 50V 0603
2824	2238 586 59812	100nF 20-80% 50V 0603
2825	2238 586 59812	100nF 20-80% 50V 0603
2826	2238 586 59812	100nF 20-80% 50V 0603
2830	2238 586 59812	100nF 20-80% 50V 0603
2832	2238 586 59812	100nF 20-80% 50V 0603
2833	2238 586 59812	100nF 20-80% 50V 0603
2900	2238 586 59812	100nF 20-80% 50V 0603
2901	2238 586 59812	100nF 20-80% 50V 0603
2902	2238 586 59812	100nF 20-80% 50V 0603
2903	2238 586 59812	100nF 20-80% 50V 0603
2904	2238 586 59812	100nF 20-80% 50V 0603
2905	2238 586 59812	100nF 20-80% 50V 0603
2906	2238 586 59812	100nF 20-80% 50V 0603
2907	2238 586 59812	100nF 20-80% 50V 0603
2908	2238 586 59812	100nF 20-80% 50V 0603

2909	2238 586 59812	100nF 20-80% 50V 0603
2910	3198 016 31510	150pF 10% 50V 0603
2911	2238 916 15641	22nF 10% 25V 0603
2912	2238 586 59812	100nF 20-80% 50V 0603
2913	2238 586 59812	100nF 20-80% 50V 0603
2914	4822 126 14506	270pF 5% 50V 0603
2915	4822 126 14506	270pF 5% 50V 0603
2916	4822 126 14506	270pF 5% 50V 0603
2917	4822 126 14506	270pF 5% 50V 0603
2918	4822 122 33761	22pF 5% 50V
2919	4822 122 33761	22pF 5% 50V
2920	2238 586 59812	100nF 20-80% 50V 0603
2921	4822 122 33761	22pF 5% 50V
2922	4822 126 14221	68PF 5% NP0 50V 0603
2923	2238 586 59812	100nF 20-80% 50V 0603
2924	2238 586 59812	100nF 20-80% 50V 0603
2925	2238 586 59812	100nF 20-80% 50V 0603
2926	4822 126 14506	270pF 5% 50V 0603
2927	4822 126 14506	270pF 5% 50V 0603
2928	4822 126 14506	270pF 5% 50V 0603
2929	4822 126 14506	270pF 5% 50V 0603
2930	2238 586 59812	100nF 20-80% 50V 0603
2931	2020 021 91729	4.7µF 20% 35V
2933	2238 586 59812	100nF 20-80% 50V 0603
2934	2238 586 59812	100nF 20-80% 50V 0603
2935	4822 126 14506	270pF 5% 50V 0603
2936	4822 126 14506	270pF 5% 50V 0603
2937	4822 126 14506	270pF 5% 50V 0603
2938	2238 586 59812	100nF 20-80% 50V 0603
2939	2020 021 91729	4.7µF 20% 35V
2940	2238 586 59812	100nF 20-80% 50V 0603
2943	5322 126 11583	10nF 10% 50V 0603

3000	4822 051 30681	680Ω 5% 0.062W
3003	4822 051 30472	4.7kΩ 5% 0.062W
3004	4822 051 30681	680Ω 5% 0.062W
3005	4822 051 30101	100Ω 5% 0.062W
3006	4822 051 30222	2.2kΩ 5% 0.062W
3008	4822 051 30101	100Ω 5% 0.062W
3009	4822 051 30102	1kΩ 5% 0.062W
3010	4822 117 12139	22Ω 5% 0.062W
3011	4822 051 30103	10kΩ 5% 0.062W
3012	4822 051 30472	4.7kΩ 5% 0.062W
3013	4822 117 12917	1Ω 5% 0.062W 0603
3015	4822 051 30103	10kΩ 5% 0.062W
3016	4822 051 30103	10kΩ 5% 0.062W
3017	4822 051 30103	10kΩ 5% 0.062W
3018	4822 051 30103	10kΩ 5% 0.062W
3019	4822 051 30472	4.7kΩ 5% 0.062W
3023	4822 051 30101	100Ω 5% 0.062W
3024	4822 051 30101	100Ω 5% 0.062W
3025	4822 051 30101	100Ω 5% 0.062W
3026	4822 051 30101	100Ω 5% 0.062W
3082	4822 117 13632	100kΩ 1% 0603 0.62W
3087	4822 051 30479	47Ω 5% 0.062W
3088	4822 117 13632	100kΩ 1% 0603 0.62W
3090	4822 051 30472	4.7kΩ 5% 0.062W
3092	4822 117 13632	100kΩ 1% 0603 0.62W
3093	4822 051 30682	6.8kΩ 5% 0.062W
3095	4822 051 30472	4.7kΩ 5% 0.062W
3096	4822 051 30472	4.7kΩ 5% 0.062W
3098	4822 117 13632	100kΩ 1% 0603 0.62W
3100	4822 051 30103	10kΩ 5% 0.062W
3101	4822 051 30339	33Ω 5% 0.062W
3103	4822 051 30339	33Ω 5% 0.062W
3106	4822 051 30339	33Ω 5% 0.062W
3108	4822 051 30339	33Ω 5% 0.062W
3110	4822 051 30339	33Ω 5% 0.062W
3112	4822 051 30339	33Ω 5% 0.062W
3113	4822 051 30103	10kΩ 5% 0.062W
3114	4822 051 30472	4.7kΩ 5% 0.062W
3116	4822 051 30339	33Ω 5% 0.062W
3117	4822 051 30472	4.7kΩ 5% 0.062W
3118	4822 051 30339	33Ω 5% 0.062W
3119	4822 051 30103	10kΩ 5% 0.062W
3120	4822 051 30339	33Ω 5% 0.062W
3122	4822 051 30339	33Ω 5% 0.062W
3124	4822 051 30339	33Ω 5% 0.062W
3126	4822 051 30339	33Ω 5% 0.062W
3128	4822 051 30339	33Ω 5% 0.062W
3130	4822 051 30339	33Ω 5% 0.062W
3132	4822 051 30101	100Ω 5% 0.062W
3133	4822 051 30339	33Ω 5% 0.062W
3135	4822 051 30339	33Ω 5% 0.062W
3137	4822 051 30101	100Ω 5% 0.062W
3138	4822 051 30339	33Ω 5% 0.062W
3142	4822 051 30101	100Ω 5% 0.062W
3143	2322 702 60829	82Ω 5% 0603
3144	4822 051 30101	100Ω 5% 0.062W
3145	4822 051 30562	5.6kΩ 5% 0.063W 0603
3147	4822 117 12139	22Ω 5% 0.062W
3149	4822 117 12139	22Ω 5% 0.062W
3154	2322 702 60829	82Ω 5% 0603
3156	4822 051 30472	4.7kΩ 5% 0.062W
3159	4822 117 12139	22Ω 5% 0.062W
3161	2322 702 60829	82Ω 5% 0603
3162	4822 051 30472	4.7kΩ 5% 0.062W
3164	4822 051 30103	10kΩ 5% 0.062W
3167	4822 051 30339	33Ω 5% 0.062W
3170	4822 051 30339	33Ω 5% 0.062W
3172	4822 051 30339	33Ω 5% 0.062W
3173	4822 051 30472	4.7kΩ 5% 0.062W
3175	4822 051 30339	33Ω 5% 0.062W
3178	4822 051 30339	33Ω 5% 0.062W
3184	4822 051 30472	4.7kΩ 5% 0.062W
3185	4822 051 30101	100Ω 5% 0.062W
3186	4822 051 30103	10kΩ 5% 0.062W
3187	4822 051 30472	4.7kΩ 5% 0.062W
3189	4822 051 30103	10kΩ 5% 0.062W
3191	4822 117 13632	100kΩ 1% 0603 0.62W
3192	4822 051 30682	6.8kΩ 5% 0.062W
3195	4822 117 13632	100kΩ 1% 0603 0.62W
3197	4822 051 30101	100Ω 5% 0.062W
3199	4822 051 30103	10kΩ 5% 0.062W
3200	4822 051 30103	10kΩ 5% 0.062W
3202	4822 051 30221	220Ω 5% 0.062W
3204	4822 051 30103	10kΩ 5% 0.062W
3205	2322 704 66342	6.34kΩ 0603 RC22H 1%
3210	4822 051 30339	33Ω 5% 0.062W
3211	4822 051 30339	33Ω 5% 0.062W
3212	2322 734 65609	56Ω 1% 0.125W 0805
3213	2322 734 65609	56Ω 1% 0.125W 0805
3214	4822 051 30339	33Ω 5% 0.062W
3215	4822 051 30339	33Ω 5% 0.062W
3216	4822 051 30109	10Ω 5% 0.062W
3217	4822 051 30339	33Ω 5% 0.062W
3218	4822 051 30339	33Ω 5% 0.062W
3219	4822 051 30103	10kΩ 5% 0.062W
3220	4822 051 30109	10Ω 5% 0.062W
3221	4822 051 30339	33Ω 5% 0.062W
3222	4822 051 30339	33Ω 5% 0.062W
3223	4822 051 30109	10Ω 5% 0.062W
3224	2322 702 60829	82Ω 5% 0603
3225	4822 051 30109	10Ω 5% 0.062W
3226	4822 051 30339	33Ω 5% 0.062W
3227	4822 051 30339	33Ω 5% 0.062W
3228	4822 051 30109	10Ω 5% 0.062W
3229	4822 051 30339	33Ω 5% 0.062W
3230	4822 051 30103	10kΩ 5% 0.062W
3231	4822 051 30109	10Ω 5% 0.062W
3232	2322 734 65609	56Ω 1% 0.125W 0805
3233	2322 734 65609	56Ω 1% 0.125W 0805
3234	4822 051 30109	10Ω 5% 0.062W
3235	4822 051 30103	10kΩ 5% 0.062W
3236	4822 051 30109	10Ω 5% 0.062W
3237	4822 051 30339	33Ω 5% 0.062W
3238	4822 051 30109	10Ω 5% 0.062W
3239	4822 051 30339	33Ω 5% 0.062W
3240	2322 704 65102	5.1kΩ 1% 0603
3241	4822 051 30339	33Ω 5% 0.062W
3242	4822 051 30109	10Ω 5% 0.062W
3243	4822 051 30339	33Ω 5% 0.062W
3244	4822 051 30339	33Ω 5% 0.062W
3245	4822 051 30109	10Ω 5% 0.062W
3246	4822 051 30339	33Ω 5% 0.062W
3247	4822 051 30339	33Ω 5% 0.062W
3248	4822 117 12139	22Ω 5% 0.062W
3249	4822 051 30339	33Ω 5% 0.062W
3250	4822 051 30472	4.7kΩ 5% 0.062W
3251	4822 051 30339	33Ω 5% 0.062W
3252	4822 051 30339	33Ω 5% 0.062W
3253	4822 117 12917	1Ω 5% 0.062W 0603
3254	4822 051 30339	33Ω 5% 0.062W
3255	4822 051 30472	4.7kΩ 5% 0.062W
3256	4822 051 30472	4.7kΩ 5% 0.062W
3257	4822 051 30223	22kΩ 5% 0.062W
3258	4822 051 30223	22kΩ 5% 0.062W
3259	4822 051 30472	4.7kΩ 5% 0.062W
3260	4822 051 30221	220Ω 5% 0.062W
3261	4822 117 12917	1Ω 5% 0.062W 0603
3262	4822 051 30472	4.7kΩ 5% 0.062W
3263	4822 051 30472	4.7kΩ 5% 0.062W
3264	4822 051 30472	4.7kΩ 5% 0.062W
3265	4822 051 30472	4.7kΩ 5% 0.062W
3266	4822 051 30472	4.7kΩ 5% 0.062W
3267	4822 051 30472	4.7kΩ 5% 0.062W
3268	4822 051 30472	4.7kΩ 5% 0.062W
3269	4822 051 30472	4.7kΩ 5% 0.062W
3270	4822 051 30221	220Ω 5% 0.062W
3271	4822 051 30221	220Ω 5% 0.062W
3272	4822 051 30221	220Ω 5% 0.062W
3273	4822 051 30339	33Ω 5% 0.062W
3274	4822 051 30221	220Ω 5% 0.062W
3276	4822 051 30102	1kΩ 5% 0.062W
3277	4822 051 30221	220Ω 5% 0.062W
3278	4822 051 30221	220Ω 5% 0.062W
3279	4822 051 30221	220Ω 5% 0.062W
3280	4822 051 30103	10kΩ 5% 0.062W
3281	4822 051 30103	10kΩ 5% 0.062W
3282	4822 051 30103	10kΩ 5% 0.062W
3285	4822 051 30109	10Ω 5% 0.062W
3287	4822 051 30472	4.7kΩ 5% 0.062W
3289	4822 051 30472	4.7kΩ 5% 0.062W
3290	4822 051 30472	4.7kΩ 5% 0.062W
3292	4822 051 30472	4.7kΩ 5% 0.062W
3294	4822 051 30221	220Ω 5% 0.062W
3295	4822 051 30221	220Ω 5% 0.062W
3296	4822 051 30221	220Ω 5% 0.062W
3297	4822 051 30221	220Ω 5% 0.062W
3298	4822 051 30221	220Ω 5% 0.062W
3299	4822 051 30221	220Ω 5% 0.062W
3307	4822 051 30103	10kΩ 5% 0.062W
3311	4822 051 30103	10kΩ 5% 0.062W
3315	4822 051 30221	220Ω 5% 0.062W
3316	4822 051 30221	220Ω 5% 0.062W
3317	4822 051 30221	220Ω 5% 0.062W
3318	4822 051 30221	220Ω 5% 0.062W
3319	4822 051 30221	220Ω 5% 0.062W
3320	4822 051 30103	10kΩ 5% 0.062W
3400	4822 051 30472	4.7kΩ 5% 0.062W
3401	4822 051 30472	4.7kΩ 5% 0.062W
3402	4822 051 30472	4.7kΩ 5% 0.062W
3403	4822 051 30472	4.7kΩ 5% 0.062W
3404	4822 051 30472	4.7kΩ 5% 0.062W
3405	4822 051 30332	3.3kΩ 5% 0.062W
3406	4822 051 30332	3.3kΩ 5% 0.062W
3407	4822 051 30332	3.3kΩ 5% 0.062W
3408	4822 051 30332	3.3kΩ 5% 0.062W
3409	4822 051 30472	4.7kΩ 5% 0.062W
3410	4822 051 30472	4.7kΩ 5% 0.062W
3411	4822 051 30472	4.7kΩ 5% 0.062W
3412	4822 051 30472	4.7kΩ 5% 0.062W
3413	4822 051 30472	4.7kΩ 5% 0.062W
3414	4822 051 30472	4.7kΩ 5% 0.062W
3415	4822 051 30472	4.7kΩ 5% 0.062W
3416	4822 051 30472	4.7kΩ 5% 0.062W
3417	4822 051 30472	4.7kΩ 5% 0.062W
3418	4822 051 30472	4.7kΩ 5% 0.062W
3419	4822 051 30472	4.7kΩ 5% 0.062W
3420	4822 051 30472	4.7kΩ 5% 0.062W
3421	4822 051 30472	4.7kΩ 5% 0.062W
3422	4822 051 30472	4.7kΩ 5% 0.062W
3423	4822 051 30472	4.7kΩ 5% 0.062W
3424	4822 051 30103	10kΩ 5% 0.062W
3425	4822 051 30103	10kΩ 5% 0.062W
3426	4822 051 30103	10kΩ 5% 0.062W
3427	4822 051 30103	10kΩ 5% 0.062W
3428	4822 051 30103	10kΩ 5% 0.062W
3429	4822 051 30339	33Ω 5% 0.062W
3430	4822 051 30339	33Ω 5% 0.062W
3431	4822 051 30339	33Ω 5% 0.062W
3432	4822 051 30339	33Ω 5% 0.062W
3433	5322 117 13036	1.2kΩ 1% 0.063W 0603
3434	4822 117 12971	15Ω 5% 0.62W 0603
3435	4822 117 12971	15Ω 5% 0.62W 0603
3436	4822 051 30339	33Ω 5% 0.062W
3437	4822 051 30339	33Ω 5% 0.062W
3438	4822 051 30339	33Ω 5% 0.062W
3439	4822 051 30339	33Ω 5% 0.062W
3440	4822 051 30339	33Ω 5% 0.062W
3441	4822 051 30331	330Ω 5% 0.062W
3442	4822 117 12139	22Ω 5% 0.062W
3443	4822 117 12139	22Ω 5% 0.062W
3444	4822 117 12139	22Ω 5% 0.062W
3445	4822 117 12139	22Ω 5% 0.062W
3446	4822 117 12139	22Ω 5% 0.062W
3447	4822 117 12139	22Ω 5% 0.062W
3448	4822 117 12139	22Ω 5% 0.062W
3449	4822 117 12139	22Ω 5% 0.062W
3450	4822 117 12139	22Ω 5% 0.062W
3451	4822 117 12139	22Ω 5% 0.062W
3452	4822 117 12139	22Ω 5% 0.062W
3453	4822 117 12139	22Ω 5% 0.062W
3454	4822 117 12139	22Ω 5% 0.062W
3455	4822 117 12139	22Ω 5% 0.062W
3456	4822 117 12139	22Ω 5% 0.062W
3457	4822 117 12139	22Ω 5% 0.062W
3458	4822 117 12139	22Ω 5% 0.062W
3459	4822 117 12139	22Ω 5% 0.062W
3460	4822 117 12139	22Ω 5% 0.062W
3461	4822 117 12139	22Ω 5% 0.062W
3462	4822 117 12139	22Ω 5% 0.062W
3463	4822 117 12139	22Ω 5% 0.062W
3464	4822 117 12139	22Ω 5% 0.062W
3465	4822 117 12139	22Ω 5% 0.062W
3466	4822 117 12139	22Ω 5% 0.062W
3467	4822 117 12139	22Ω 5% 0.062W
3468	4822 117 12139	22Ω 5% 0.062W
3469	4822 117 12139	22Ω 5% 0.062W

3470	4822 117 12139	22Ω 5% 0.062W
3471	4822 117 12139	22Ω 5% 0.062W
3472	4822 117 12139	22Ω 5% 0.062W
3473	4822 117 12139	22Ω 5% 0.062W
3474	4822 117 12139	22Ω 5% 0.062W
3475	4822 117 12139	22Ω 5% 0.062W
3476	4822 117 12139	22Ω 5% 0.062W
3477	4822 117 12139	22Ω 5% 0.062W
3478	4822 117 12139	22Ω 5% 0.062W
3479	4822 117 12139	22Ω 5% 0.062W
3480	4822 117 12139	22Ω 5% 0.062W
3481	4822 117 12139	22Ω 5% 0.062W
3482	4822 117 12139	22Ω 5% 0.062W
3483	4822 117 12139	22Ω 5% 0.062W
3484	4822 117 12139	22Ω 5% 0.062W
3485	4822 117 12139	22Ω 5% 0.062W
3486	4822 117 12139	22Ω 5% 0.062W
3487	4822 117 12139	22Ω 5% 0.062W
3488	4822 117 12139	22Ω 5% 0.062W
3489	4822 117 12139	22Ω 5% 0.062W
3490	4822 117 12139	22Ω 5% 0.062W
3491	4822 117 12139	22Ω 5% 0.062W
3492	4822 117 12139	22Ω 5% 0.062W
3493	4822 117 12139	22Ω 5% 0.062W
3494	4822 117 12139	22Ω 5% 0.062W
3495	4822 117 12139	22Ω 5% 0.062W
3496	4822 051 30339	33Ω 5% 0.062W
3497	4822 117 13632	100kΩ 1% 0603 0.62W
3498	4822 051 30103	10kΩ 5% 0.062W
3499	4822 051 30103	10kΩ 5% 0.062W
3503	5322 117 13034	1.5kΩ 1% 0.063W 0603
3504	5322 117 13034	1.5kΩ 1% 0.063W 0603
3700	4822 051 30101	100Ω 5% 0.062W
3701	4822 051 30101	100Ω 5% 0.062W
3702	4822 051 30472	4.7kΩ 5% 0.062W
3703	5322 117 13055	75R 1% 0.063W 0603
3705	2322 704 63001	300Ω 0603 1%
3706	2322 704 61002	1kΩ 0603 RC22H PM1
3707	2322 704 61002	1kΩ 0603 RC22H PM1
3709	2322 704 63001	300Ω 0603 1%
3710	5322 117 13055	75R 1% 0.063W 0603
3713	2322 704 63001	300Ω 0603 1%
3714	2322 704 61002	1kΩ 0603 RC22H PM1
3716	2322 704 61002	1kΩ 0603 RC22H PM1
3717	2322 704 63001	300Ω 0603 1%
3718	5322 117 13055	75R 1% 0.063W 0603
3721	2322 704 63001	300Ω 0603 1%
3722	2322 704 63001	300Ω 0603 1%
3723	2322 704 61002	1kΩ 0603 RC22H PM1
3724	2322 704 61002	1kΩ 0603 RC22H PM1
3725	2322 704 87501	750Ω 603 RC22H 1%
3726	2322 704 87501	750Ω 603 RC22H 1%
3727	4822 051 30339	33Ω 5% 0.062W
3728	4822 051 30681	680Ω 5% 0.062W
3729	4822 051 30109	10Ω 5% 0.062W
3730	4822 051 30109	10Ω 5% 0.062W
3731	4822 051 30472	4.7kΩ 5% 0.062W
3732	4822 051 30339	33Ω 5% 0.062W
3805	4822 051 30101	100Ω 5% 0.062W
3806	4822 051 30101	100Ω 5% 0.062W
3807	4822 051 30101	100Ω 5% 0.062W
3808	4822 051 30472	4.7kΩ 5% 0.062W
3809	4822 051 30103	10kΩ 5% 0.062W
3810	4822 051 30103	10kΩ 5% 0.062W
3811	4822 051 30103	10kΩ 5% 0.062W
3812	4822 051 30103	10kΩ 5% 0.062W
3813	4822 051 30103	10kΩ 5% 0.062W
3814	4822 051 30103	10kΩ 5% 0.062W
3815	4822 051 30103	10kΩ 5% 0.062W
3817	4822 051 30472	4.7kΩ 5% 0.062W
3820	4822 051 30472	4.7kΩ 5% 0.062W
3821	4822 051 30472	4.7kΩ 5% 0.062W
3822	4822 051 30472	4.7kΩ 5% 0.062W
3825	4822 051 30472	4.7kΩ 5% 0.062W
3826	4822 051 30472	4.7kΩ 5% 0.062W
3827	4822 051 30472	4.7kΩ 5% 0.062W
3831	4822 051 30472	4.7kΩ 5% 0.062W
3832	4822 051 30472	4.7kΩ 5% 0.062W
3836	4822 051 30101	100Ω 5% 0.062W
3840	4822 051 30103	10kΩ 5% 0.062W
3849	4822 051 30103	10kΩ 5% 0.062W
3850	4822 051 30103	10kΩ 5% 0.062W
3851	4822 051 30103	10kΩ 5% 0.062W
3852	4822 051 30103	10kΩ 5% 0.062W
3854	4822 051 30222	2.2kΩ 5% 0.062W
3855	4822 051 30223	22kΩ 5% 0.062W
3860	4822 117 12139	22Ω 5% 0.062W
3861	4822 117 12139	22Ω 5% 0.062W
3862	4822 117 12139	22Ω 5% 0.062W
3863	4822 117 12139	22Ω 5% 0.062W
3864	4822 117 12139	22Ω 5% 0.062W
3865	4822 117 12139	22Ω 5% 0.062W
3866	4822 117 12139	22Ω 5% 0.062W
3867	4822 117 12139	22Ω 5% 0.062W
3868	4822 117 11817	1.2kΩ 1% 1/16W
3869	4822 051 30472	4.7kΩ 5% 0.062W
3901	2322 704 61801	180Ω 0603 RC22H PM1
3902	2322 704 65601	560Ω 1% 0603
3905	2322 704 61801	180Ω 0603 RC22H PM1
3906	2322 704 65601	560Ω 1% 0603
3907	4822 051 30101	100Ω 5% 0.062W
3908	4822 051 30181	180Ω 5% 0.062W
3909	4822 051 30689	68Ω 5% 0.063W 0603
3910	4822 051 30689	68Ω 5% 0.063W 0603
3911	4822 051 30561	560Ω 5% 0.062W
3912	4822 051 30222	2.2kΩ 5% 0.062W
3913	4822 117 12139	22Ω 5% 0.062W
3914	4822 051 30689	68Ω 5% 0.063W 0603
3915	4822 051 30472	4.7kΩ 5% 0.062W
3916	4822 051 30479	47Ω 5% 0.062W
3917	4822 051 30479	47Ω 5% 0.062W
3918	5322 117 13055	75R 1% 0.063W 0603
3919	4822 051 30102	1kΩ 5% 0.062W
3920	5322 117 13055	75R 1% 0.063W 0603
3921	4822 051 30102	1kΩ 5% 0.062W
3922	4822 051 30689	68Ω 5% 0.063W 0603
3923	4822 051 30223	22kΩ 5% 0.062W
3924	5322 117 13055	75R 1% 0.063W 0603
3925	4822 051 30103	10kΩ 5% 0.062W
3926	4822 051 30102	1kΩ 5% 0.062W
3927	5322 117 13055	75R 1% 0.063W 0603
3928	4822 051 30102	1kΩ 5% 0.062W
3929	2322 704 65609	56Ω 0603 RC22H 1%
3930	5322 117 13055	75R 1% 0.063W 0603
3931	4822 051 30102	1kΩ 5% 0.062W
3932	5322 117 13055	75R 1% 0.063W 0603
3933	4822 051 30102	1kΩ 5% 0.062W
3934	5322 117 13055	75R 1% 0.063W 0603
3935	5322 117 13055	75R 1% 0.063W 0603
3936	5322 117 13055	75R 1% 0.063W 0603
3937	5322 117 13055	75R 1% 0.063W 0603
3938	5322 117 13055	75R 1% 0.063W 0603
3939	5322 117 13055	75R 1% 0.063W 0603
3955	4822 117 12917	1Ω 5% 0.062W 0603
4001	4822 051 30008	Jumper 0603
4005	4822 051 30008	Jumper 0603
4111	4822 051 30008	Jumper 0603
4113	4822 051 30008	Jumper 0603
4115	4822 051 30008	Jumper 0603
4117	4822 051 30008	Jumper 0603
4123	4822 051 30008	Jumper 0603
4125	4822 051 30008	Jumper 0603
4201	4822 051 30008	Jumper 0603
4202	4822 051 30008	Jumper 0603
4204	4822 051 30008	Jumper 0603
4205	4822 051 30008	Jumper 0603
4308	4822 051 30008	Jumper 0603
4311	4822 051 30008	Jumper 0603
4315	4822 051 30008	Jumper 0603
4316	4822 051 30008	Jumper 0603
4401	4822 051 30008	Jumper 0603
4402	4822 051 30008	Jumper 0603
4404	4822 051 30008	Jumper 0603
4406	4822 051 30008	Jumper 0603
4407	4822 051 30008	Jumper 0603
4800	4822 051 30008	Jumper 0603
4803	4822 051 30008	Jumper 0603
4815	4822 051 30008	Jumper 0603
4816	4822 051 30008	Jumper 0603
4822	4822 051 30008	Jumper 0603
4900	4822 051 30008	Jumper 0603
4901	4822 051 30008	Jumper 0603
4904	4822 051 30008	Jumper 0603
4906	4822 051 30008	Jumper 0603

5001	4822 157 11499	BLM11P600SPT
5005	4822 157 11499	BLM11P600SPT
5008	4822 157 11499	BLM11P600SPT
5009	4822 157 11499	BLM11P600SPT
5010	4822 157 11499	BLM11P600SPT
5100	4822 157 11499	BLM11P600SPT
5103	4822 157 11499	BLM11P600SPT
5104	4822 157 11499	BLM11P600SPT
5200	4822 157 11499	BLM11P600SPT
5202	4822 157 11499	BLM11P600SPT
5203	4822 157 11499	BLM11P600SPT
5204	4822 157 11499	BLM11P600SPT
5302	4822 157 11499	BLM11P600SPT
5400	4822 157 11499	BLM11P600SPT
5401	4822 157 11717	BLM31P500SPT
5402	4822 157 11717	BLM31P500SPT
5404	4822 157 11499	BLM11P600SPT
5405	4822 157 11717	BLM31P500SPT
5406	4822 157 11717	BLM31P500SPT
5501	4822 157 11717	BLM31P500SPT
5502	4822 157 11499	BLM11P600SPT
5503	2422 535 94995	10µH 1014520%
5700	4822 157 11499	BLM11P600SPT
5701	4822 157 11876	6.8µH 10% 0805
5703	4822 157 10586	2.2µH 10% 0805
5704	4822 157 11876	6.8µH 10% 0805
5706	4822 157 10586	2.2µH 10% 0805
5707	4822 157 11876	6.8µH 10% 0805
5709	4822 157 10586	2.2µH 10% 0805
5711	4822 157 70649	4,7µH (NL322522T-4R7J)
5712	4822 157 70649	4,7µH (NL322522T-4R7J)
5713	4822 157 11499	BLM11P600SPT
5802	4822 157 11499	BLM11P600SPT
5803	4822 157 11499	BLM11P600SPT
5804	4822 157 11499	BLM11P600SPT
5808	4822 157 11499	BLM11P600SPT
5809	4822 157 11499	BLM11P600SPT
5901	4822 157 11499	BLM11P600SPT
5902	4822 157 70649	4,7µH (NL322522T-4R7J)
5903	4822 157 70649	4,7µH (NL322522T-4R7J)
5904	3198 018 90050	Bead 1kΩ at 100MHz
5905	2422 549 45634	0603 EMI 100MHZ 60R
5906	2422 549 45634	0603 EMI 100MHZ 60R
5907	2422 536 00598	1.5µH 1210 20%
5908	2422 536 00598	1.5µH 1210 20%
5909	2422 549 45634	0603 EMI 100MHZ 60R
5910	2422 536 00598	1.5µH 1210 20%
5911	2422 536 00598	1.5µH 1210 20%
5912	2422 536 00598	1.5µH 1210 20%
5913	2422 536 00598	1.5µH 1210 20%
5914	2422 549 45634	0603 EMI 100MHZ 60R
5915	2422 549 45634	0603 EMI 100MHZ 60R
5916	4822 157 11499	BLM11P600SPT

6000	4822 130 11528	1PS76SB10
6100	4822 130 11528	1PS76SB10
6101	4822 130 11528	1PS76SB10

7001	9322 116 74668	LD1117D33
7002	9352 683 81115	74LVC1G32GW
7003	5322 130 60159	BC846B
7004	9352 673 95518	SAA7118E/V1
7103	9352 683 81115	74LVC1G32GW
7104	9352 500 20118	74LVC08AD
7106	9322 191 99685	NCP303LSN29
7107	9352 500 20118	74LVC08AD
7109	9352 115 40118	74LVC245APW
7111	5322 209 71568	PC74HCT14T
7300	9352 317 00118	74LVC125AD
7400	8203 600 00371	PNX7100EH/C3
7402	2722 171 08819	4MHZ 15P FXO34FL
7403	3198 010 42310	BC847BW
7500	9322 188 69668	STS5DNF20V
7501	9322 207 93668	NCP1571D
7701	9322 200 00685	AD8091ART
7702	9322 205 55668	AD8092AR
7703	9322 190 09671	ADV7302AKST
7704	9322 142 88668	LF25CDT
7807	9965 000 24409	AM29DL640G-70EI/'FF8.1'
7809	9322 130 41668	M24C64-WMN6
7810	9965 000 18099	M24C64-WMN6/CHR BOOT1.0
7812	9322 187 09668	MT48LC16M16A2TG-7E
7813	9322 187 09668	MT48LC16M16A2TG-7E
7900	9352 684 56115	74LVC1GO4GW
7901	9352 684 56115	74LVC1GO4GW
7902	4822 130 61553	DTC124EU
7903	9352 456 80115	74HCT1G125GW
7904	5322 130 60159	BC846B
7905	4822 130 61553	DTC124EU
7906	5322 130 60159	BC846B
7907	5322 130 60159	BC846B
7908	5322 130 60159	BC846B
7909	5322 130 60159	BC846B
7911	5322 130 60159	BC846B
7912	5322 130 60159	BC846B

In / Out Extension Board

Various

1920	2422 025 17897	CON H6P F
1921	2422 025 16924	CON H7P
1922	2422 026 05374	SOC CNCH H 3P F 3L1
1925	4822 267 31729	CONNECTOR

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2250	3198 017 41050	1µF 10V 0603
2254	4822 122 33753	150pF 5% 50V
2255	2238 586 59812	100nF 20-80% 50V 0603
2256	2238 586 59812	100nF 20-80% 50V 0603
2257	5322 126 11578	1nF 10% 50V 0603
2258	2238 586 59812	100nF 20-80% 50V 0603
2259	2222 867 15339	33pF 5% 50V 0603
2260	2238 586 59812	100nF 20-80% 50V 0603
2261	4822 124 42234	100µF 20% 6,3V
2265	5322 126 11583	10nF 10% 50V 0603
2266	2238 586 59812	100nF 20-80% 50V 0603

-WW-

3250	4822 116 52219	330Ω 5% 0.5W
3252	4822 051 30101	100Ω 5% 0.062W
3255	4822 117 13632	100kΩ 1% 0603 0.62W
3259	4822 116 52201	75Ω 5% 0.5W
3260	4822 051 30222	2.2kΩ 5% 0.062W
3261	4822 051 30471	470Ω 5% 0.062W
3262	4822 051 30561	560Ω 5% 0.062W
3263	4822 116 52195	47Ω 5% 0.5W
3264	4822 051 30101	100Ω 5% 0.062W
4001	4822 051 30008	Jumper 0603
4201	4822 051 30008	Jumper 0603

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5250	2422 536 00019	TRANSFORMER 6RG
5251	2422 549 43062	Bead 600Ω at 100MHz
5255	2422 549 43062	Bead 600Ω at 100MHz

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6255	9322 175 41687	SOC OPT JFJ1000-010010
6256	9322 146 61685	DF3A6.8FU
6257	9322 146 61685	DF3A6.8FU
6258	9322 146 61685	DF3A6.8FU

7250	5322 209 11517	PC74HCU04T